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Journal of Electricity

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July 15, 1923

San Francisco

MACOMB

STANDARD

PORCELAIN

The above illustration shows the new type "Macomb Strain," designed to supersede the old square and egg shaped Strains. Made in three sizes—with extra deep grooves and high flashover values.

The Bulldog

Assembled Split Knob

Made and Sold Under License U. S. Patent February 3, 1920

HAS A GRIP LIKE ITS NAMESAKE

SOLID AND SPLIT KNOBS
TUBES CLEATS
INSULATORS

Order Thru Your Jobber

MANUFACTURED BY
ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS, U. S. A.

Pacific Coast Distributers

Baker-Joslyn Company

183-199 First St.
SAN FRANCISCO

330-332 Azusa St.
LOS ANGELES

2424-28 First Ave. So.
SEATTLE

RELY ON LOS ANGELES SEATTLE B&J SAN FRANCISCO SERVICE

Distributers

Hot Galvanized Pole Line Hardware
Wood Poles, Cross Arms and Pins
Construction and Linemen's Tools
Porcelain and Glass Insulators
Porcelain Knobs, Tubes and Cleats
Insulated and Bare Copper and Iron Wires
Rigid Iron Conduit and Fittings
Flexible Metallic and Non-metallic Conduit and Armored Conductors
Switches, Switchboards and Fuses
Insulating Materials

Journal of Electricity entered as second class matter February 17, 1921, at the post office at San Francisco, under the Act of Congress, March 3, 1879.
Published the 1st and 15th of each month, at Rialto Building, San Francisco, California.

Not a Dissenting Voice

"WE are very much impressed with this extra flexible Rockbestos Cable," writes an electrical dealer.— "We are able to operate our motors at a higher temperature when wound with Rockbestos," says an electrical engineer. — "Stood up very well under our tests," says another.

A glance at the many letters received from men who use and sell Rockbestos Wire, shows they are all agreed on Rockbestos superiority.

No other wire can approach Rockbestos in service and value. No other wire can equal its economy over a period of time.

Rockbestos is non-burning. Heat that would destroy so-called "slow burning" insulation leaves Rockbestos unharmed, for Rockbestos Wire is insulated with pure long-fibre asbestos, saturated with special chemicals. No matter how long it is used it will continue to perform satisfactorily.

Every wiring need can be cared for by one of the many styles of Rockbestos — Magnet Wire, Heater Cord, Fixture Wire, Stove Wire, Motion Picture Cable and Switchboard Wire.

If you're a dealer-contractor, use Rockbestos to build up your reputation for wiring that's 100% right.

If you're an engineer, specify Rockbestos on all your wiring and protect yourself against needless breakdowns and repair bills.

ROCKBESTOS

ASBESTOS INSULATED WIRES AND CABLES

Manufactured by ROCKBESTOS PRODUCTS CORPORATION, NEW HAVEN, CONN.

Baker-Joslyn Company

183-199 First St.
SAN FRANCISCO

330-332 Azusa St.
LOS ANGELES

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Flexible Metallic and Non-metallic Conduit and Armored Conductors
Switches, Switchboards and Fuses
Insulating Materials

I. P. Morris Department

The Wm. Cramp & Sons Ship & Engine Building Co.

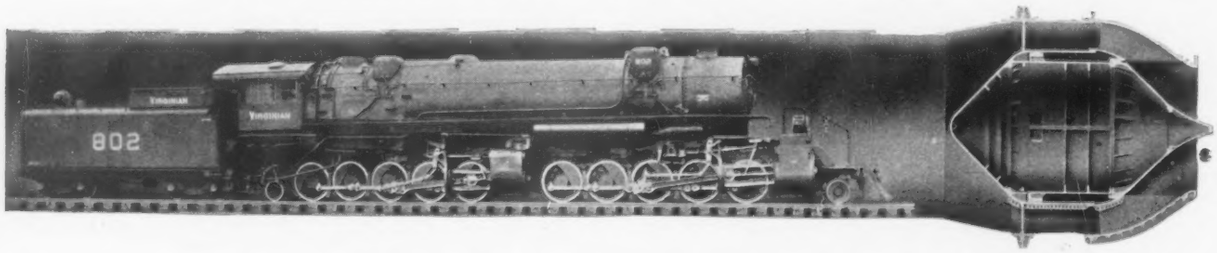
Richmond and Norris Sts., Philadelphia

Designers and Builders of

JOHNSON HYDRAULIC VALVES

Three 21 Ft. Inlet x 14 Ft. Outlet Johnson Valves Under Construction for the Niagara Falls Power Company

Comparative sizes of the Niagara Valve with the world's largest locomotive.



These valves will discharge under normal conditions 3,400 c. f. s. under a head of 213.5 ft.

Cast Iron Plunger.

Cast Steel Casing.

ASSOCIATED COMPANIES:

THE PELTON WATER WHEEL CO., SAN FRANCISCO AND NEW YORK.
DOMINION ENGINEERING WORKS, LTD., MONTREAL, CANADIAN LICENSEES.
M. HILPERT & CO., RIO DE JANEIRO, BRAZILIAN LICENSEES.

Penstock of Big Creek No. 2, Southern California Edison Company. Insert shows ease of installation of heavy 36" pipe, by the Kellogg method.

PIPE LINE ENGINEERING

Demonstrated economy of installation and maintenance combined with increased efficiency in manufacture and operation have proved the value of Kellogg hammer-forged, welded pipe lines in modern hydro-electric engineering.

Attention to detail in design and manufacture to meet the requirements of each particular installation has resulted in universal recognition of the high standard of Kellogg performance in hydroelectric installations.

The M. W. Kellogg Company

140 Cedar Street New York City

Pacific Coast Representatives

The Pelton Water Wheel Co.

1991 Harrison Street San Francisco

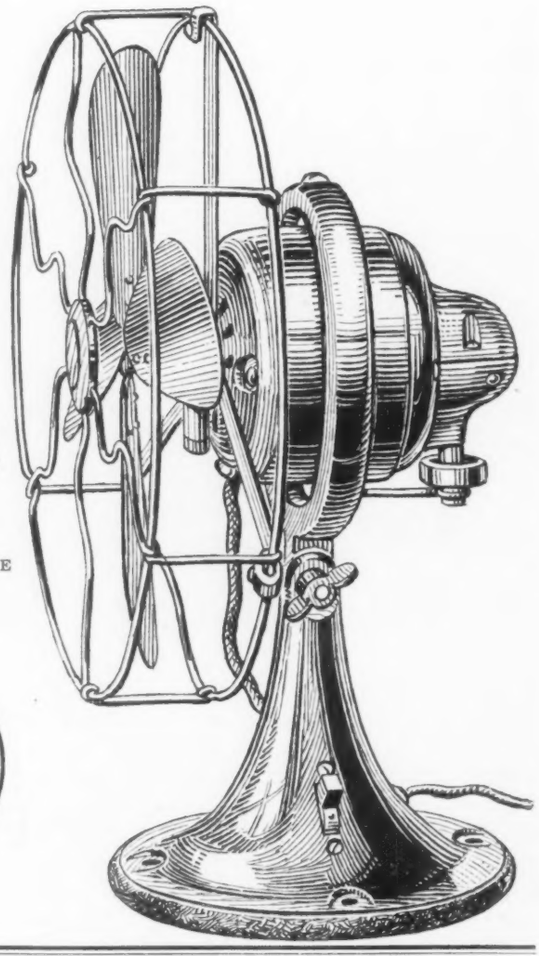
This is a G-E Fan Season

Over seventy-five newspapers on the Pacific Coast are running G-E fan advertising. The copy carries the effective message—"Keep the Air Round You Fresh, Keep It Alive."

Every one of these advertisements ties in with the "Check" Seal program, which gives your prospects further evidence of the sterling quality of G-E Fans.

Two remarkable values are featured, the 9" G-E Whiz and the 9" G-E Whiz Oscillator, *with* tumbler switches.

Uncomfortable people want fans in a hurry. Order now so that your G-E Fan Stock is adequate to meet the demand.



PACIFIC STATES
ELECTRIC COMPANY

SAN FRANCISCO LOS ANGELES OAKLAND PORTLAND SEATTLE SPOKANE

Distributors for the Pacific Coast

Keep the air 'round the Home fresh-keep it "Alive"!
Why not make home the coolest place in town with live, fresh air from a G-E Fan? You can run a G-E Fan all day long for the trifling cost of a fair cigar or a soda.
A Product of Merchandise Department GENERAL ELECTRIC COMPANY
G-E Fans
-use no more current than a single lamp
For Sale By All
"Check" Seal Dealers

T. M. Reg. 1921

To the left is a reduction of one of the G-E Fan advertisements now running in seventy-five newspapers on the Pacific Coast. These advertisements are building G-E Fan business for you. Take advantage of this campaign by completing your stocks and by talking G-E Fans to your customers.

Open Hearth Steel

With open hearth steel there is a wide margin of safety through excess tensile strength. This steel, which is used in all Hubbard pole line hardware, has a tensile strength of from 55,000 to 65,000 pounds per square inch.

Tests show that the common iron used in ordinary pole line hardware will break under a tensile strain of approximately 35,000 pounds. The best grade of malleable iron is still weaker. But Hubbard open hearth steel can be bent cold to 180 degrees flat upon itself, without surface fracture of the bent portion.

Every item of Hubbard pole line hardware will stand this test. Wherever Hubbard hardware is used, the public, the linemen and expensive equipment are insured against accident.

HUBBARD & COMPANY
Pittsburgh, Pa.

PACIFIC STATES
ELECTRIC COMPANY

SAN FRANCISCO LOS ANGELES OAKLAND PORTLAND SEATTLE SPOKANE

Quality Electrical Merchandise
THE MARK THAT MEANS INSPECTED & CERTIFIED by PACIFIC STATES ELECTRIC COMPANY
Chosen from the Markets of the World

Distributors for the Pacific Coast

T. M. Reg. 1921

San Diego--- Where Copper Wire Serves Our Navy

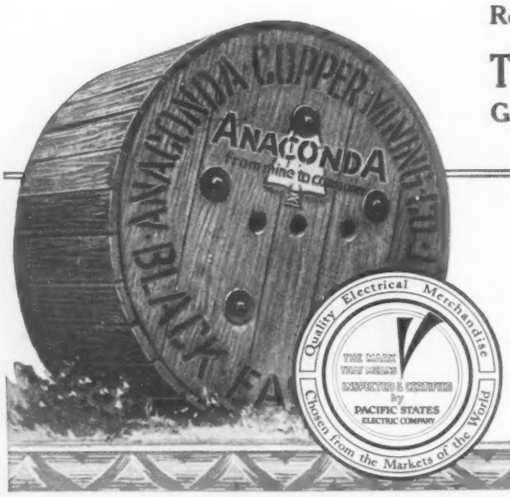
SAN DIEGO, the second largest natural harbor on the Pacific Coast, is an important naval center.

Electricity for her submarine, destroyer and air bases and for the training, coaling and radio stations is brought from distant mountains over hundreds of miles of copper wire.

It is natural that San Diego, as with other important Pacific Coast cities, receives its electricity over Anaconda copper wire. Power companies on the Pacific Coast specify Anaconda for many reasons. It is 99.9% pure and has a conductivity of 97.5% or better. Prompt delivery of orders is insured by a unified organization and by the strategic geographical location of the Anaconda plant.

ANACONDA COPPER MINING COMPANY
Rolling Mills Department **Conway Bldg., Chicago**

THE AMERICAN BRASS COMPANY
General Offices **Waterbury, Conn.**



PACIFIC STATES
ELECTRIC COMPANY

SAN FRANCISCO LOS ANGELES OAKLAND PORTLAND SEATTLE

Distributors for the Pacific Coast

"Bolted Through Solid Earth"

"Never Creep" Anchors bolt your Pole Lines to Solid Earth

The above photograph shows the auger used to bore the hole for "Never Creep" Anchors. All the equipment necessary to install these sturdy anchors is an auger such as the one illustrated and a special mallet for driving in the anchor rod.

The Never-Creep Anchor is an iron "dead man" installed in 1/5 to 1/3 the time required to dig a pit for a slug or log.

Its holding power is developed by pulling against undisturbed earth.

Its anchor rod is equipped with an improved thimble eye.

There is no other anchor on the market which has these features. There is no other anchor which meets every requirement so well.

Manufactured by

CHANCE COMPANY
CENTRALIA, MO.

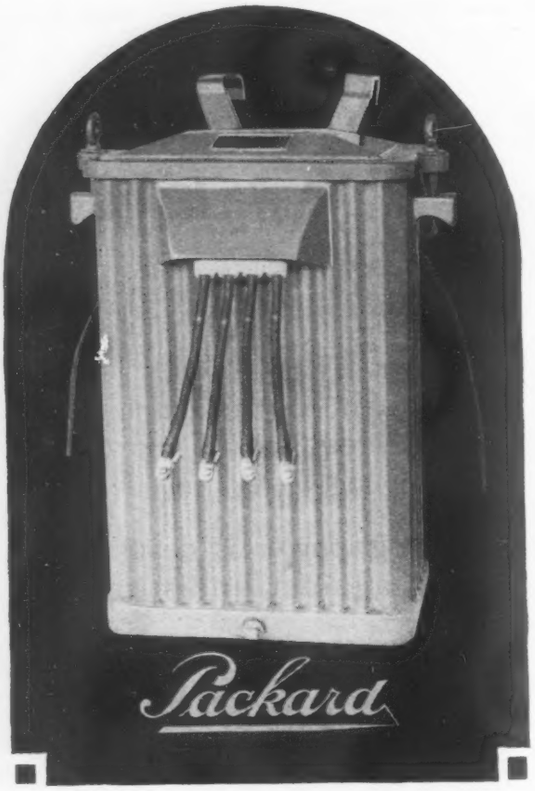
T. M. Reg. 1921

PACIFIC STATES ELECTRIC COMPANY

SAN FRANCISCO LOS ANGELES OAKLAND PORTLAND SEATTLE SPOKANE

T. M. Reg. 1921

Exclusive Pacific Coast Sales Agents



The FAME of a NAME

When a man offers a friend a certain brand of cigar, tells him he has bought a certain make of automobile, or that his son is being educated in a certain university, he does so without apology or explanation knowing that that cigar, automobile or university has earned for itself recognition as a leader in its particular field. He knows that to patronize the product or institution of a famous name marks him as a man of discrimination, taste and ability to judge value.

The name "Packard" signifies in transformers something decidedly above the ordinary. Something in which quality dominates from the selection of material and manufacture to the service rendered.

A. S. Lindstrom
111 New Montgomery St.,
San Francisco

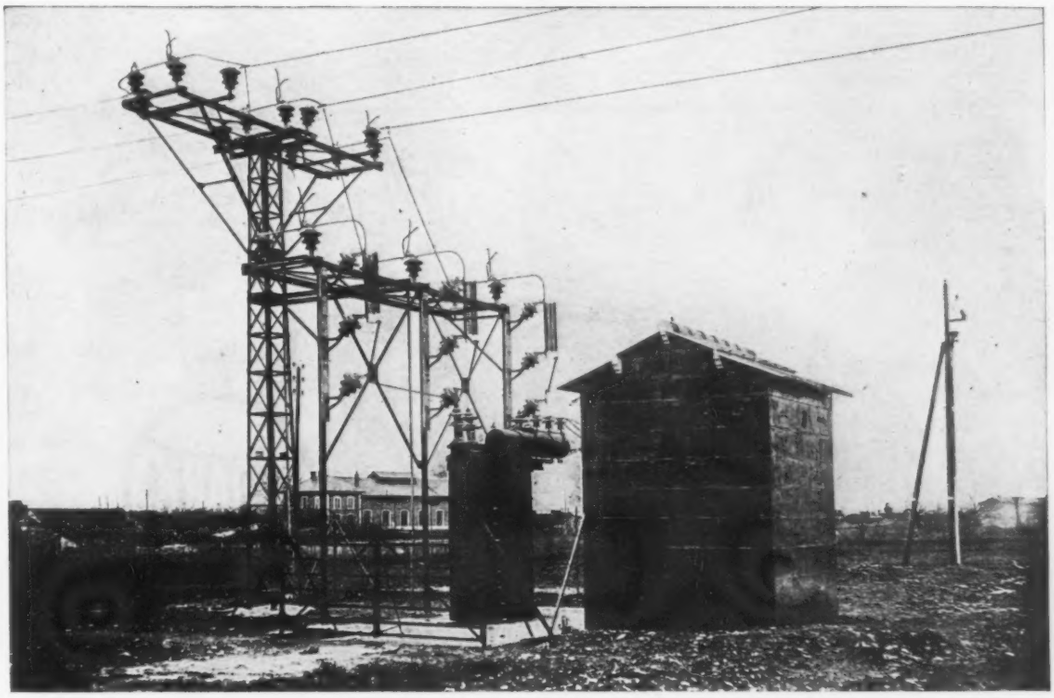
Burton R. Stare
619 Fourth Ave.,
Seattle

J. D. Smith
451 E. Third St.,
Los Angeles

THE PACKARD ELECTRIC COMPANY, WARREN OHIO

HIGH TENSION EQUIPMENT

IN FRANCE



Delta-Star 66000 Volt Unit Type Equipment on a French Transmission Line

A FIXED IDEA IS A GIMLET—EVERY YEAR IT SINKS IN ONE MORE TURN

The Literary Digest of April 28 quoting from the Electrical World says: "The growth of sentiment in favor of putting apparatus out-of-doors instead of under a roof has been an interesting phenomenon. Ten years ago the radical who suggested putting switches or transformers out-of-doors to save space and expense within the four walls of a station was looked upon as a fit subject for the psychopathic ward." "The first open air switches were installed often from sheer inability to meet architects' bills. They were followed by out-of-door transformers and by substations in their entirety."

Ten years ago Delta-Star had a fixed idea on this subject, every year drove the gimlet one more turn until today Unit Type outdoor substations are a recognized standard throughout the world. And here is another turn of the gimlet—the day of constructing substations simply to meet load conditions, regardless of appearance, will soon be a thing of the past. People object to unsightly structures in their neighborhood and a substation built without regard to appearance is simply an obstacle in gaining good will for the utility. Community pride and public good will is fostered when a Unit Type station is installed.

If you are going to do it at all—Do it right with Unit Type

DELTA-STAR ELECTRIC CO., 2433-61 Fulton Street, Chicago, Illinois

Manufacturers of High-Tension Equipment

LOS ANGELES
W. W. Kirk,
212 I. W. Hellman Bldg.

SALT LAKE CITY
L. Brandenburger,
419 Dooly Bldg.

SEATTLE
W. R. Hendrey
Hoge Bldg.

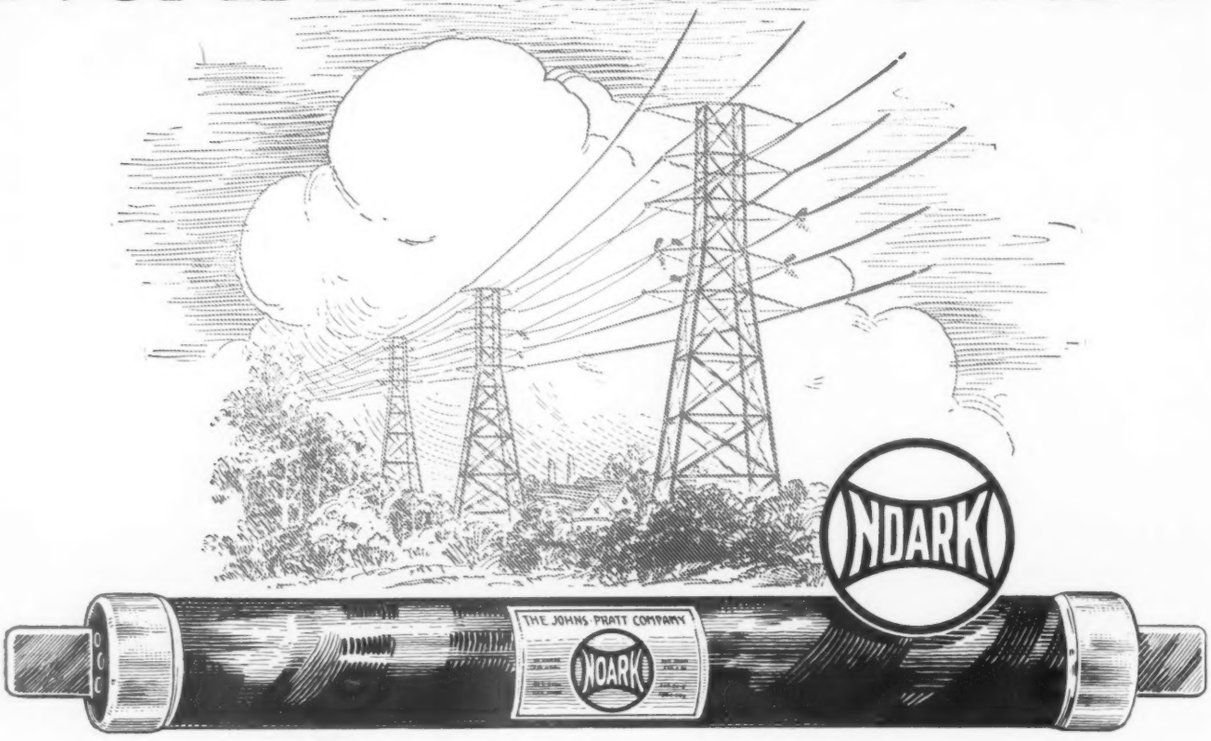
DELTA-STAR

The Standard of Comparison

UNIT TYPE INTERCHANGEABLE PARTS

UNIT TYPE UNIT TYPE UNIT TYPE UNIT TYPE UNIT TYPE UNIT TYPE UNIT TYPE UNIT TYPE UNIT TYPE

NOARK HIGH VOLTAGE FUSES



From ½ ampere at 2500 volts to 5 amperes at 22000 volts

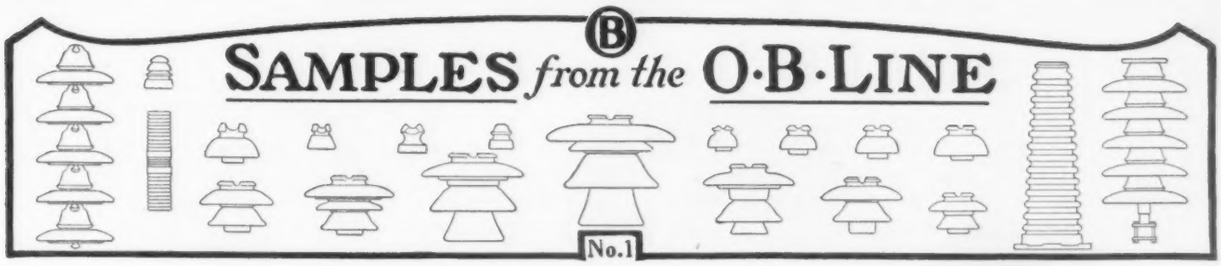
A complete line of high tension primary fuse protective devices for transformers and branch circuits, etc. Covers standard ampere and voltage requirements at 2500 volts, 4400 volts, 6600 volts, 13200 volts, 22000 volts and all intermediate voltages.

The Johns-Pratt Company

Hartford PROTECTION NOARK SERVICE JP VULCABESTON Conn., U.S.A.

BOSTON (9) *161 Summer Street*
PHILADELPHIA *22 South 15th Street*
CHICAGO *35-37 So. Desplaines Street*
PITTSBURGH *104 Sixth Street*
CLEVELAND *1365 Ontario Street*
ST. LOUIS *314 North Broadway*
NEW YORK *41 East 42nd Street*
SAN FRANCISCO *74 New Montgomery Street*

EXPORT DEPARTMENT, *30 Church Street, New York, N. Y., U. S. A.*



One-piece Insulators for distribution lines

THE half-scale illustrations show a few of the smaller insulators from the O-B Line.

No. 10387, the unit shown at the top, has a voltage rating of 4000. It is 3¼ inches in diameter and weighs about 14 ounces.

Next below it is No. 9404, rated at 6600 volts. This is a popular insulator, and one on which we can ordinarily make prompt deliveries.

The third sample, No. 9953, also has a general rating of 6600 volts, but is designed primarily for carrying large cables.

The illustration at the foot of the page shows No. 12848, which has a general rating of 11,000 volts.

Every insulator receives the same care as large high-tension O-B Insulators

In Manufacture
Made of wet process porcelain by the same methods used for the larger insulators.

In Inspection
Each piece is carefully inspected to insure highest quality and uniformity.

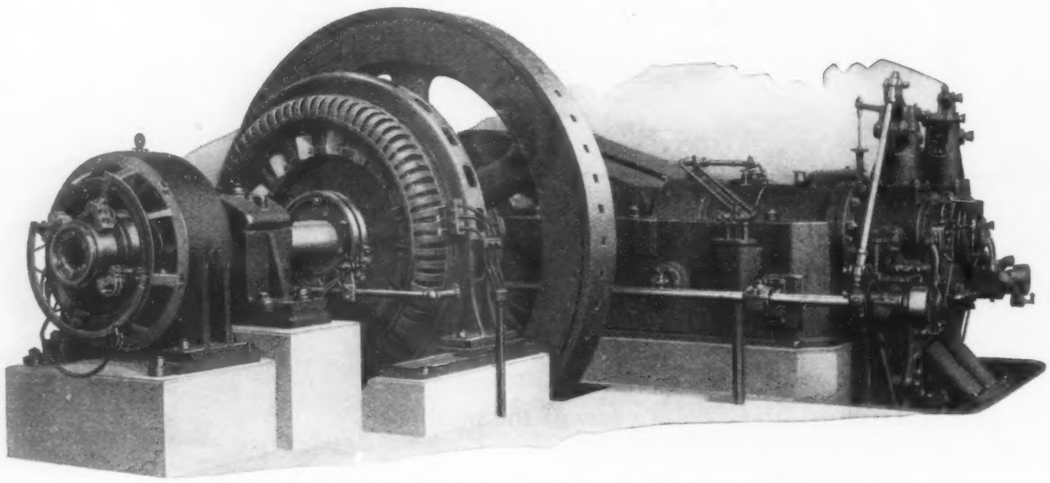
In Packing
Special attention has been given to developing improved packing methods giving a maximum of protection to the insulator and a convenient package for store room and field use.

All of which means good insulators and best possible performance in an important service.

The Ohio Brass Co.
Mansfield, Ohio, U.S.A.

112

New York Philadelphia Pittsburgh Charleston, W.Va. Chicago Los Angeles San Francisco Paris, France
Products: Trolley Material, Rail Bonds, Electric Railway Car Equipment, High Tension Porcelain Insulators, Third Rail Insulators



150 KV-A., 2300 Volt, 225 R.P.M. Allis-Chalmers Diesel Engine Alternator Unit

Diesel Engine Power Units

The unit illustrated above is particularly adapted to the power requirements of the small city or industrial plant.

The high thermal efficiency of the Allis-Chalmers Diesel Engine makes it an especially economical prime mover for such service.

This unit, consisting of Diesel Engine with direct connected Generator and Exciter, is one of the many sizes and types of complete units built by the Allis-Chalmers Mfg. Co.

This equipment incorporates the engineering experience and carries the guarantee of one of the world's largest manufacturers of power and electrical machinery which organization is ready to serve you in any power problem.

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN, U.S.A.

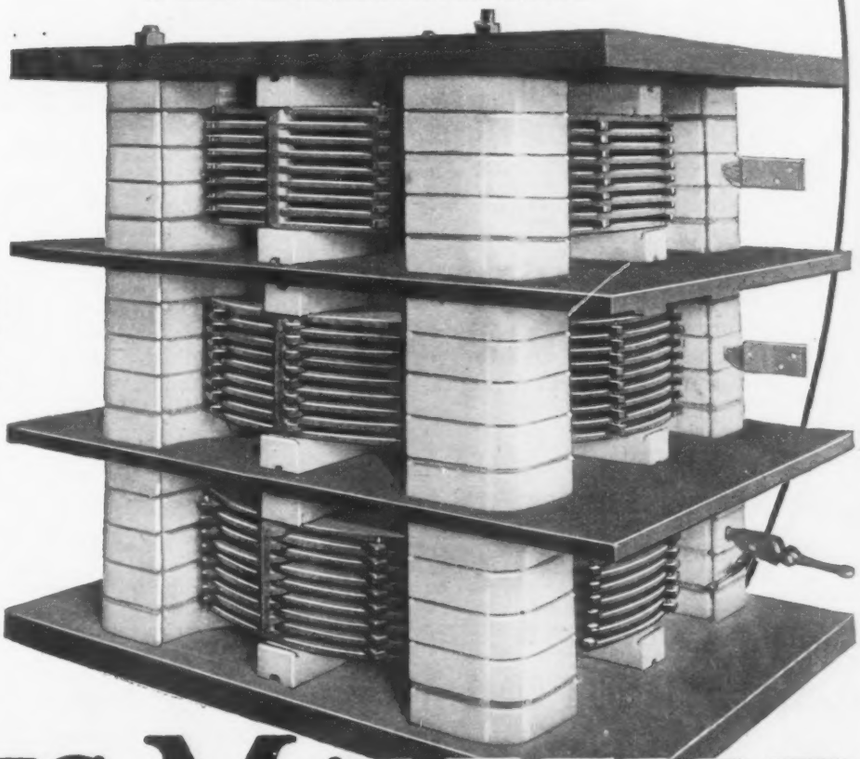
ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

EBONY ASBESTOS WOOD—not only for switchboards but wherever the highest grade insulating base is demanded

Ebony Asbestos Wood achieved its first reputation as the "no compromise" switchboard material, because it possesses every essential characteristic that a good switchboard must have.

Alert engineers quickly perceived its value in other fields—on high tension work because of its marvelous electrical strength; on severe service because of its rugged durability; on complex installations because it is easily worked, and on "pretty" jobs because of its fine appearance.

JOHNS-MANVILLE Inc., Madison Ave. at 41st St., N. Y. City
Branches in 56 Large Cities
For Canada: Canadian Johns-Manville Co., Ltd., Toronto



Johns-Manville Ebony Asbestos Wood used as an insulator in 138-133⅓ K. V. A., 350 Amp., 11000 V., 3 phase Unit Type Reactance Coils.

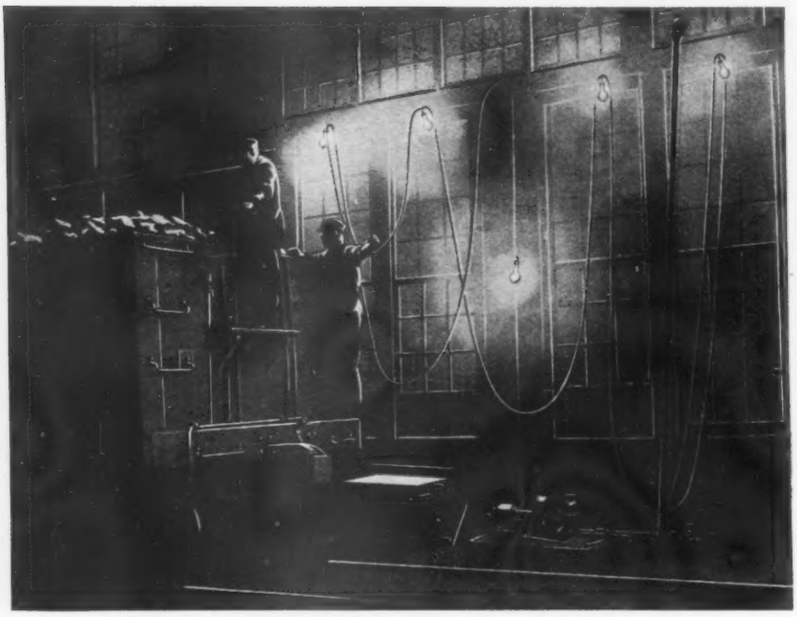
New York Edison Company, Waterside Station, New York City.

Through—
Electrical Materials
FOR
Utilities
Jobber
Contractor
AND
Dealer

JOHNS-MANVILLE

ROME WIRE

Super Service Cord and Cable for All Emergency Work



Equip your portable lighting set with Super Service Cord! Above picture shows Super Service Cord doing real emergency work with a portable TURBOGEN lighting set.

Rome Super Service Cord and Cable meets every emergency requirement whether in or out of the shop. Ideal for service in garages, machine shops, foundries, factories, hotels, for construction work and for portable tools, for use in chemical plants; wet sloppy places, battery charging rooms. Super Service Cord is flexible and does not kink, curl, or tangle, but always lays flat. It may be dragged along the ground, over sharp rocks, ashes, or cinders; bent around sharp corners, yanked and hauled without damage or danger.

R

The fine copper conductors are rope stranded, cotton wrapped and covered with a 30% rubber insulation, and finished with a close cotton braid of distinctive color to indicate polarity.

For added tensile strength a layer of strong cotton cord binds these separate conductors together. The cord is then covered with two heavy layers of Super Service, 60% Para rubber, with imbedded seine twine cords and vulcanized in steel moulds under tons of pressure. The result is a wire of super flexibility and super performance. Send for data and a sample, and make your own tests.

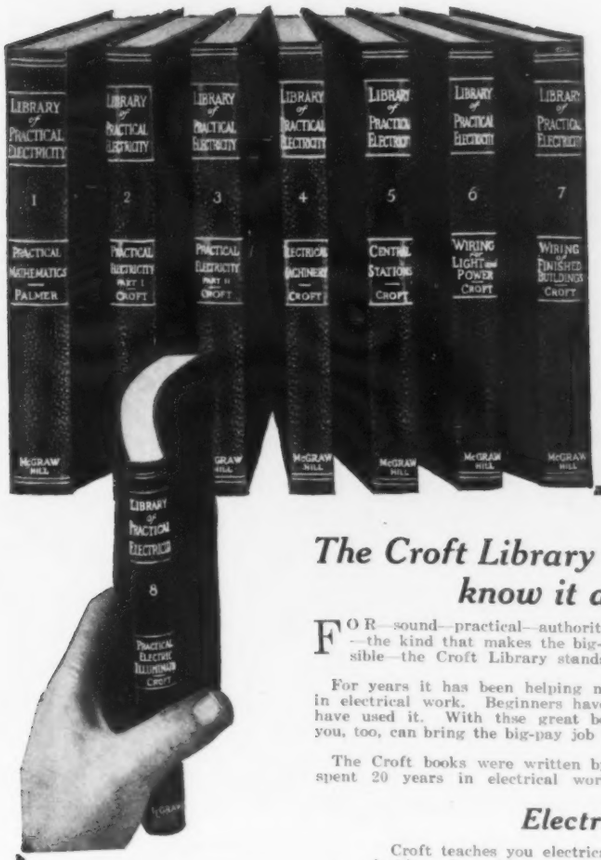
ROME WIRE COMPANY Mills and Executive Offices: ROME, N. Y.

Diamond Branch, Buffalo, N. Y.

New York 50 Church St. | Chicago 14 E. Jackson Blvd. | Los Angeles J. G. Pomeroy, 336 Azusa St. | Boston Little Bldg. | Detroit 25 Parsons St. | 2137-L

WIRE-ROME

The Coupon Below Starts You To Bigger Pay



EVERYONE knows that big salaries are paid in the electrical field for expert knowledge. The man who knows electricity from the ground up—the man who knows electricity as experts know it—can pick his own job and name his own salary.

It isn't such a difficult matter to master the finer points of electrical practice and step up to a bigger job.

It simply means a little earnest spare-time study with the Croft Library of Practical Electricity—eight great books packed to the covers with sound, practical, pay-raising electrical information.

The Croft Library will teach you electricity as experts know it and put you in line for an expert's pay

FOR—sound—practical—authoritative information—the kind that makes the big-pay envelope possible—the Croft Library stands alone.

For years it has been helping men to step ahead in electrical work. Beginners have used it—experts have used it. With these great books to help you, you, too, can bring the big-pay job within your reach.

The Croft books were written by a man who has spent 20 years in electrical work—who has gone through all the various stages—who has done the work you are doing now and who has risen to his present position in the electrical world simply by studying his job.

Croft knows how to teach electrictiy—how to fit men for big-pay jobs—because he has been through the mill and knows what is needed to get ahead. What he knows about electrical practice—and he knows a lot—has been gained by actual shirt-sleeve contact with everyday electrical problems.

Electrical practice from the ground up

Croft teaches you electrical practice complete—inside and outside work—central stations and the whole subject. He takes you in quick, easy steps from the simplest principles to the complete and economical operation of a great central station.

He tells you the things you need to know about motors, generators, armatures, commutators, transformers, circuits, currents, switchboards, distribution systems—electrical machinery of every type—wiring for light and power—how to do it in accordance with the National Electric Code—wiring of finished buildings—underwriters' and municipal requirements—how to do the complete job, from estimating it to completion—the latest and most improved methods of lighting—lamps and lighting effects, etc.

The Croft Library is the last word in practical electrical education. No man who wishes to achieve success in the electrical field can afford to be without it.

These men are ordering the Croft books

Armature Winders
Motor Repair Men
Dynamo Tenders
Engineering Students
Power Plant Engineers
Service Men
Central Station Men
Electrical Contractors
Draftsmen
Auto Mechanics
Electrical Apprentices
Machine Designers
Hydro-Electric Operators
Teachers of Electricity
Meter Readers
Linemen
Electrical Engineers
Electricians
Welders
Appliance Salesmen
Meter Testers
Wiremen

These great books are now only $19.50

We have clipped $8.00 off the price of this popular electrical library—made it $19.50, instead of $27.50, a reduction of about 30%. And more than that, we are offering the easiest terms we have ever made on the Croft books. You now pay $1.50 in ten days and the balance at the rate of **only** $2 a month. This gives you ten full months to complete your payments.

The new price and the new terms make the Croft Library the biggest bargain in sound electrical training ever offered to the industry.

Free examination
No money in advance
Small monthly payments

We want you to test our statements—we want you to compare the Croft books with others. Fill in and mail the coupon attached and we will send you the entire set of eight volumes for ten ten days' Free Examination. We take all the risk—pay all the charges. You assume no obligation—you pay nothing unless you decide to keep the books. Then $1.50 in ten days and the balance at the rate of $2 a month. Send the Coupon NOW and see the books for yourself.

Our new price and new terms make it possible for every electrical worker to own America's standard electrical library.

Just send the coupon!

Free Examination Coupon

McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York.

Gentlemen:—Send me the LIBRARY OF PRACTICAL ELECTRICITY (shipping charges prepaid), for 10 days' free examination. If satisfactory, I will send $1.50 in ten days and $2 per month until the special price of $19.50 has been paid. If not wanted, I will write you for return shipping instructions. **(Write plainly and fill in all lines.)**

Name .....

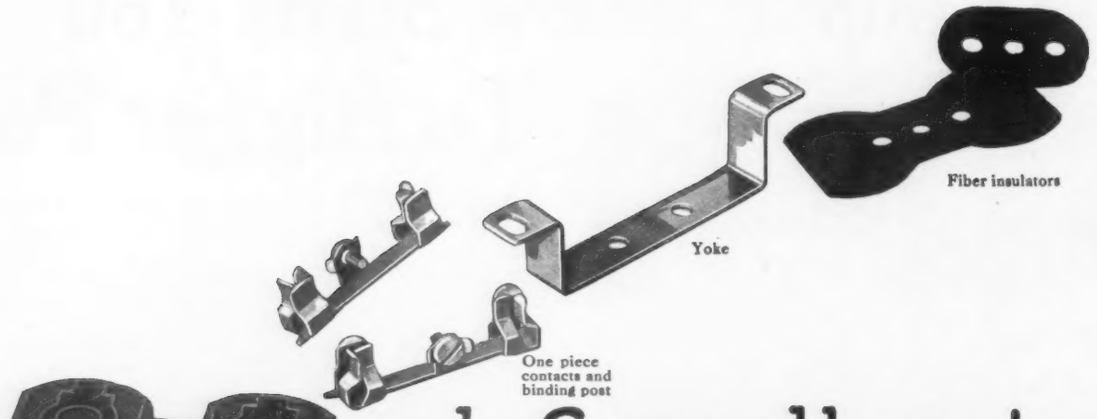
Home Address .....

City and State .....

Employed By .....

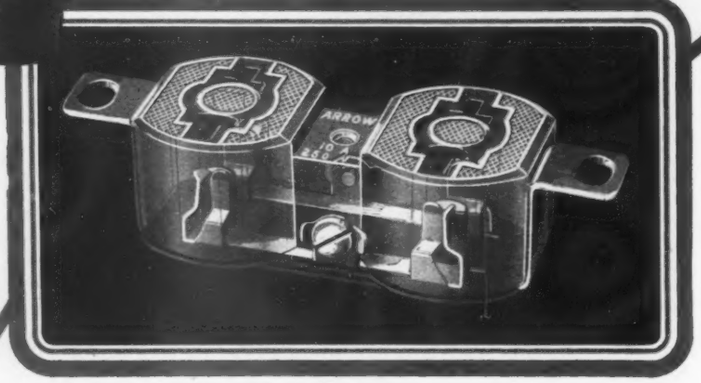
Occupation .....

O-7-15-23



only 6 assembly parts

No. 8251—Single
No. 8248—Duplex



At Last!

A Convenience Outlet stripped down to Fundamentals —

1. Simplicity that approaches perfection—no unnecessary parts.
2. One piece contacts and binding post—no loose connections.
3. More dependable in operation.
4. Smaller—more wiring room.
5. Easy to wire.
6. Double T slots—restricted openings.
7. A wonderful engineering achievement.

ELECTRICAL ARROW WIRING DEVICES

ARROW

The complete line of Wiring Devices

A Successful Convention

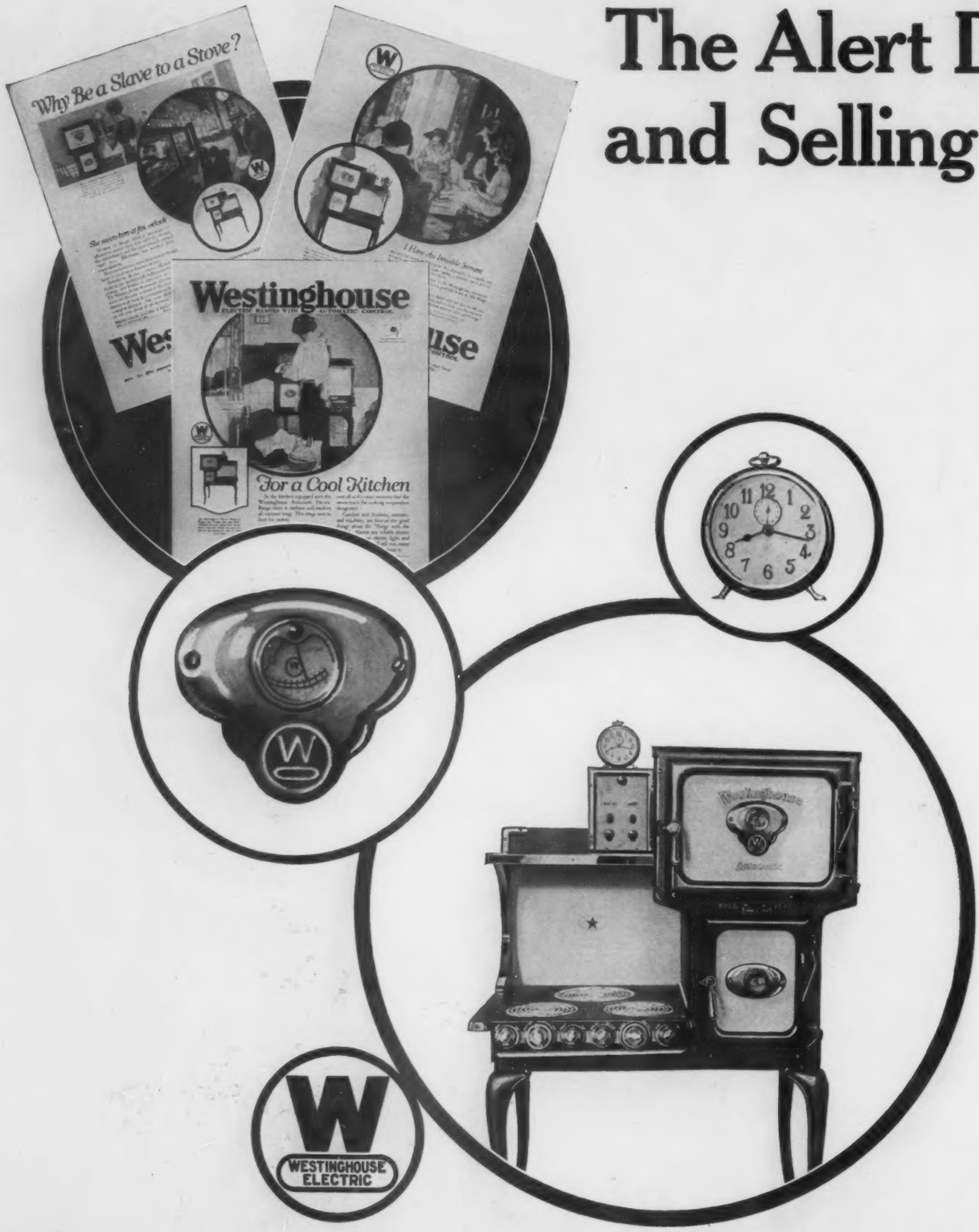
The Pacific Coast Electrical Association convention, held in San Francisco, from June 19th to 23rd, was an unqualified success—reflecting in many ways the very healthy condition of the industry in the West and pointing toward an era of greater prosperity.

The commercial section sessions developed unusual interest in the discussions on sales ideas and sales opportunities, showing the potential business that awaits the promotion activities of those engaged in the sale of electrical merchandise.

This condition is decidedly reassuring to the contractor-dealer, who may confidently look forward to a greater measure of prosperity than he has yet enjoyed.

This condition is enhanced through the natural expansion of electrical markets, the discovery of business in the older fields which have previously been overlooked—and the tendency to join hands in a spirit of cooperation, traditionally Western, throughout the electrical industry.

The Alert Deale and Selling Forc



Westinghouse

aler Can Capitalize the Good Will orce of this National Advertising

Our Big, Broad, Selling Plan has cultivated practically every home in your territory--it has SOLD the Electric Cooking Idea along with this Wonderful Automatic Range.

Westinghouse Automatic Electric Range —with the clock —and the thermostat

For months we have been hammering home—for your benefit—the message of the electric range and the manner in which it frees the woman from slavery to the kitchen. This has been done largely through the medium of the best national magazines, some one of which is read in almost every home.

This is the basis of our campaign—
to SELL the CONSUMER.

And to further the continuity of this plan, we have devised window displays, placards, window cards, newspaper cuts and other forms of promotional matter, which any dealer can secure —and thus tie-in with the great plan of selling—to capitalize the extensive campaign which has been going on.

As for the range itself, the CLOCK and THERMOSTAT features are the big service arguments that move the purchaser to action. These and other features will be fully explained to you at any district office, or by the nearest agent-jobber.

These Agent-Jobbers can give you immediate service:

Fobes Supply Co., San Francisco, Oakland, Seattle and Portland.
Illinois Electric Co., Los Angeles.
Intermountain Electric Co., Salt Lake City.
Mine & Smelter Supply Co., Denver.
Montana Electric Co., Butte, Montana.
The Washington Electric Supply Co., Spokane
The Hawaiian Electric Co., Ltd., Honolulu.

Westinghouse Electric & Manufacturing Co.
Mansfield Works, Mansfield, Ohio

Westinghouse

Display the Waffle Iron Prominently and Watch Interest Develop Sales

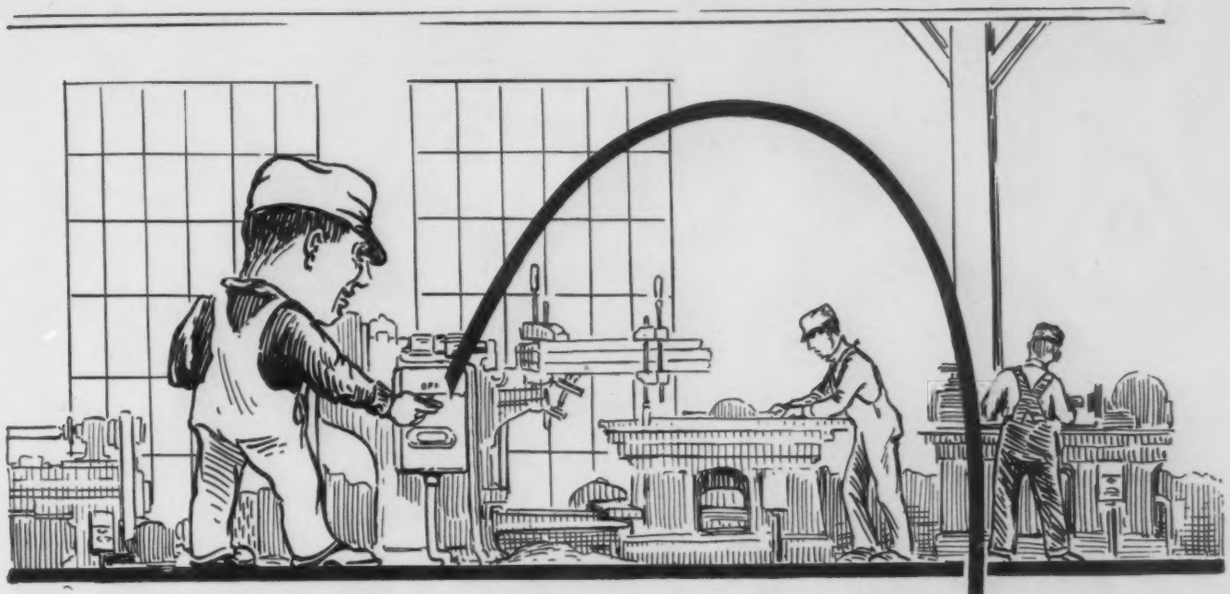
Some people thought that the waffle iron was merely a novelty and would soon pass out of existence. But those people were badly mistaken. Your experience as a dealer has undoubtedly proved the fallacy of this prediction.

In spite of this continued popularity, every dealer has an opportunity to develop more interest and more SALES in this appliance. The straight way to this end is to feature the waffle iron more prominently, conduct occasional demonstrations—and in other ways show that the waffle iron is an every-day appliance, by reason of its ability to make shortcake, waffles, plain wafers, chocolate brownies, omelettes, and many of the other favorite dishes.

Our nearest agent-jobber will supply you with the various sales helps and other information which you may need.

Westinghouse Electric & Manufacturing Co.
Mansfield Works, Mansfield, Ohio

Westinghouse



Prepare Your Stocks to serve the Growing Markets for Motor-Starters

Lest you should forget! Your store needs that variety of interest obtainable through the display and exploitation of electrical products other than those used in the home.

The Safety Motor-Starter will add to that variety and interest, besides offering additional opportunities for sales, turnover and PROFITS.

One manufacturer, who has been using Westinghouse Safety Motor-Starters, said that his liability insurance dropped $162. Therein lies a real sales argument, for maximum safety is provided to both the operator and the motor through the use of this WK-10 Starter, which is illustrated.

Free advisory service is always available from any Westinghouse Safety-Switch specialist.

Westinghouse Electric & Manufacturing Co.
Mansfield Works, Mansfield, Ohio

Westinghouse

Speaking of Fans—

Feature These Features

—and "cash in" on the national campaign of consumer advertising.

This is a genuine home fan of substantial Westinghouse construction, finished in ivory to harmonize perfectly with home decorations.

It is extremely attractive and stands out pre-eminent in your store display. It will produce sales just as it attracts attention wherever it is displayed.

There's a real home campaign to help you sell the home fan, consisting of new literature, new advertising and new dealer helps. Everything is ready to apply to your individual selling problems.

The home fan campaign is one of two distinct fan campaigns, each designed to reach the consumer in the most effective way. For additional details, get in touch with one of the agent-jobbers listed on the third page of this advertising series.

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East Pittsburgh, Pa.

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Denver, 910 Fifteenth St.
El Paso, Mills Building
Fresno, Griffith-McKenzie Bldg.
Los Angeles, 420 S. San Pedro St.
Portland, Porter Bldg.
Salt Lake City, 2nd South and Main Sts.
San Francisco, 1 Montgomery St.
Seattle, 3451 E. Marginal Way
Spokane, 821 Old National Bank Bldg.
Tacoma, 615 Rust Bldg.
Tucson, Immigration Bldg.

Westinghouse

Journal of Electricity

A McGraw-Hill Publication

Established 1887

C. T. HUTCHINSON, Acting Editor

NORMAN S. GALLISON
GEORGE C. TENNEY
Associate Editors

ROBERT SIBLEY, Consulting Editor
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VOLUME 51 | SAN FRANCISCO, JULY 15, 1923 | NUMBER 2

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PUBLISHERS OF

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JAMES H. McGRAW, President
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WASHINGTON, Colorado Building
CHICAGO, Old Colony Building
PHILADELPHIA, Real Estate Trust Building
CLEVELAND, Leader-News Building
ST. LOUIS, Star Building
NEW YORK, Tenth Ave. at 36th St.

Subscription rates in United States, Canada, Mexico, Porto Rico, U. S. Possessions, Argentina, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Nicaragua, Panama, Guatemala, Paraguay, Peru, Honduras, Salvador, Uruguay, and Spain, $2.00 per year, 2 years $3.00. Elsewhere $3.00 Gold (13 Shillings). Single copy, 25c. When change of address is required, both old and new addresses must be given. Notice must be received two weeks before change takes place.

McGRAW-HILL CO., Inc., New York

Publishers of

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Electrical Retailing | Industrial Engineer (*Published in Chicago*)
Chemical and Metallurgical Engineering
American Machinist | Ingeniería Internacional
Electrical World | Electric Railway Journal
Engineering and Mining Journal-Press
Bus Transportation | Engineering News-Record
Coal Age | Electrical Merchandising | Power

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By McGraw-Hill Company of California

Entered as second-class matter Feb. 17, 1921, at the Post Office at San Francisco, California, under Act of March 3, 1879.

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Printed in U. S. A.

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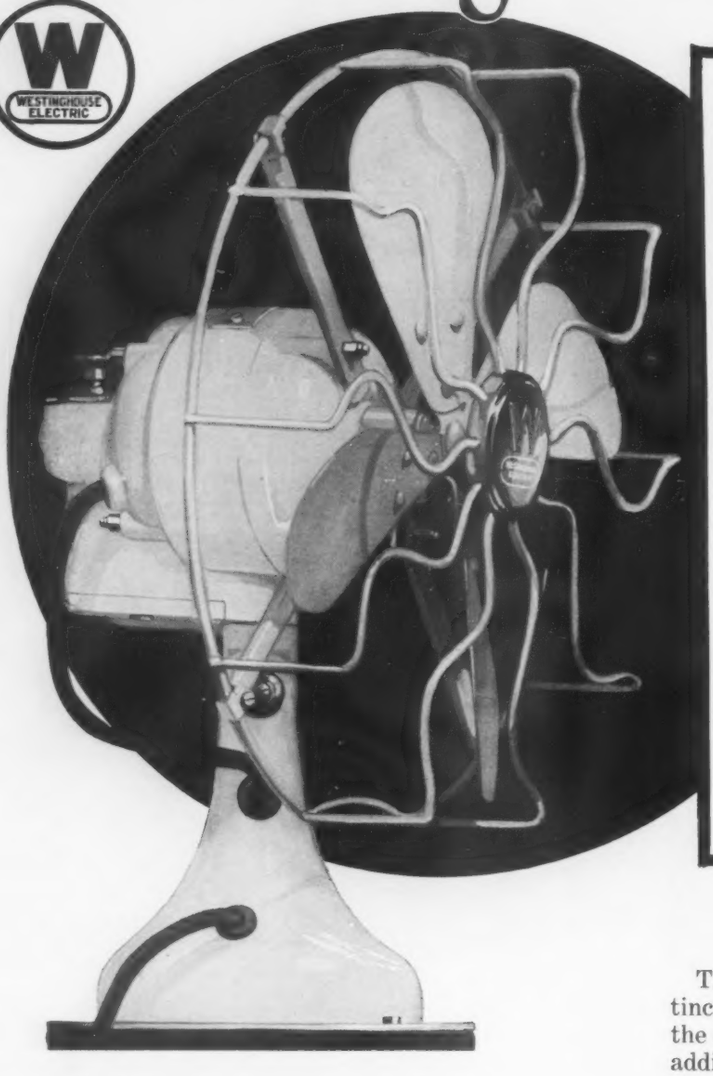

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"RUBBER-ARMORED"

Tough as a Tire

For Electrical Tools and Appliances.

Packed for Service.

All sizes are furnished in lengths as desired. No. 16 and No. 18 are also packed in special cartons containing 250 feet each, so constructed that the cord may be drawn out as needed without disturbing the remainder of the coil. The package is suitable for reshipment.

SIMPLEX WIRE & CABLE CO

MANUFACTURERS

201 Devonshire St., Boston 9
15 S. Desplaines St., Chicago
612 Howard St., San Francisco
120 West 32nd St., New York

The Danger in Superpower

PUBLIC attention is at present attracted and popular imagination fired by the word "superpower." Long before the United States Geological survey conducted in the region between Washington and Boston, some two years ago, engineers have discussed the possibilities and advantages of regional interconnected systems of electrical energy. No one can deny that economical power production must be the basis for future industrial expansion, and a requisite for the advance of our civilization, and that electricity will be the method by which this power is furnished.

BEFORE a beginning can be made, publicity and public sentiment must favor such stupendous developments as will undoubtedly be needed to conserve and utilize our power resources, but there is a grave danger in some of the publicity which has appeared in connection with "superpower." Electricity is associated with magic in the popular mind and many articles appearing in the popular magazines tend to stimulate this attitude. Writers with little evident knowledge of the engineering difficulties, political procedures, capital requirements or economic aspects of the generation and transmission of electricity draw liberally upon their imaginations to paint misleading word pictures of an immediate era when electricity will be practically free and universally available.

SMALL of vision indeed must be the man in the electrical industry who does not realize the part electricity is destined to play in the emancipation of mankind. But there is no one more cognizant of the laborious task in achieving this "millenium." Many years will pass before a nation-wide interconnected system can be possible or practicable. But it is none the less certain.

THE danger lies in arousing an anticipation of realizing the benefits too soon. Demagogues have been quick to appreciate the opportunity to play upon the popular fancy by the promise of government-developed "cheap power." While it was necessary to secure financial aid from the government for the original superpower survey this need no longer be done. The electric utilities are able, and stand ready to effect the desired end at an earlier time than would result from any governmental participation.

THE electrical industry of the nation should follow the example of the great utilities of the Pacific Coast who have created, without government participation, a net of transmission lines from Canada to Mexico. If the industry is to frustrate the movements for the state and national development which have arisen frequently of late and checkmate their further spread, actual installations and work should be undertaken without delay.

Electricity Has Made the Small Ice Plant Commercially Possible

ELECTRICITY has revolutionized the business of artificial ice making in the past few years. Not only has it been demonstrated to be cheaper than fuel-driven motive power, but labor and maintenance costs are much lower. Perhaps the most radical change that has been brought about, as is discussed by Mr. Lincoln elsewhere in this issue, is the development of the small unit, the plant of from twenty to thirty tons capacity.

Original ice plants were steam driven and used practically all of the exhaust steam in the manufacture of "distilled water ice." As long as it was thought necessary to use distilled water the steam engine had a great advantage over the electric motor in the ice-making field. But of late years it has been discovered that raw water can be used in the manufacture of ice. With the discovery of "raw water ice" the steam plant gradually lost this advantage and is gradually being driven from the field by the motor-driven compressor. The development about this time of the low-speed synchronous motor for direct connection to reciprocating compressors has probably been one of the most important factors in hastening the electrification of ice plants.

Ice plants today furnish an increasingly important part of most of central station load, and, as Mr. Lincoln points out, "The ice factory offers an opportunity for engineering study for the purpose of improving methods and conditions prevailing in this large and well established industry that is demonstrating its desire to keep up with the demand of the times both as to installed capacity and the use of the most improved equipment and methods."

Building Store Lighting Business Will Aid All Branches of the Industry

PROGRESSIVE merchants in the larger centers of population have long realized the value of intensive window and store lighting in making the cash register ring more often and in larger figures. Light plays a tremendous part in making people stop and look at window displays, but of the two million stores in this country it has been estimated that but one in thirty-five has an intensity of fifteen foot-candles in their window.

Much interest has been aroused nationally in the opportunities of the electrical industry in developing store lighting by a monograph, "Building Store Lighting Business," recently published by the Society for Electrical Development in cooperation with the Joint Society for Business Development. This monograph shows from reports of the Store Lighting Division, National Sales Bureau, Commercial National Section N.E.L.A., what better store lighting means to the central station, and likewise to every branch of the electrical industry. It also tells what some companies and local cooperative organizations have done and suggests what others can do to build business. In addition the monograph contains suggestions for the conduct of a better store lighting activity and details material that has been specially prepared to assist in obtaining results.

Every merchant is desirous of increasing his business and will make use of those things, which, with a reasonable outlay, will help him to achieve his object. The California Electrical Cooperative Campaign is conducting an activity, in the form of a portable window, the success of which has shown that the merchant is all too ready to take advantage of the opportunities of better lighting. He is quick to sense the great psychological value of light in creating prestige for his store, and its practical value of selling the goods once the prospect has stopped to examine them.

On another page in this issue is described a lighting installation in a department store in a California city. The proprietor of the "Wonder," a department store in Fresno, a city of around 60,000 population, has installed equipment which rivals the best in metropolitan centers. The justification for his investment is already apparent in increased sales. This installation has attracted wide attention and will well repay a personal examination.

Electrical merchants and contractors will be well repaid for their efforts to increase their store lighting business. The fixture man, the jobber and lighting equipment manufacturer have a similar opportunity —the time for action is the immediate present.

Public Ownership Proving a Failure

MUNICIPAL ownership of public utilities is fast running its course. There are a few new experiments being made, but there is a growing list of failures and woeful cases of waste of taxpayers' money on stubborn attempts to make communities support politically-ridden properties. Soon the deceived people will be begging private enterprises to take them off their hands, as the Communists of Germany now are trying to unload many of their undertakings upon private corporations and others on private managements, says the Cincinnati Enquirer.

The United States Census Bureau and the McGraw Central Station Directory each supply information on this phase of municipal ownership. Recent statistics bear on light plants. There has been a decided tendency in recent years for municipalities to turn over the manufacture of power to private companies and hang on to the more easily manipulated distributing work. In 1912, less than nine per cent of the municipal plants in the United States purchased their power from private producers. In 1917, the proportion had risen to 23.3 per cent, and in 1921, to 26 per cent. Now all the municipally-owned and operated plants produce only four per cent of the electrically generated power in the United States. Of the population, 93.8 per cent is served by private corporations, and 6.2 per cent by municipal plants.

Service costs provide another striking contrast and show that politics in the operation of utilities is expensive. The Census Bureau reports that in 1921 the average tax rate of cities having municiplants was $19.31. The average rate in cities supplied from non-municipal plants was $15.50. This was partly because where municipal plants are ex-

empted from taxation, so that their political managers can have more leeway, the rates on other property are proportionately higher. Also, because the taxes levied on private plants help to reduce the taxes on other property and to lower the average.

It is not surprising, therefore, that there should be a tiring of the public with municipal ownership and operation of utilities. A costly lesson has been learned by many communities where the experiment has been tried. Other also will learn. And yet there will be communities to rush blindly into the clutch of municipal ownership in spite of all experience of others.

Removal of Director of Reclamation Service Objected to by Engineers

THE peremptory ousting of Arthur P. Davis as director of the United States Reclamation Service has caused something of a furor in engineering circles during the past two weeks. The Federated American Engineering Societies have raised formal and vigorous objection to the displacement of Director Davis, and the appointing in his stead a man who is apparently not technically trained and fitted to direct an important technical service of the government.

This procedure is looked upon with grave concern by the engineers and technical men of the United States, because such summary action as discharging an eminently successful employee after 35 years of service, without a hearing or adequate explanation, and with a request to hand in his resignation to take effect within two weeks, will undermine the morale of all the technical agencies of the government and may lead the most competent men to more readily accept engagements with commercial and industrial agencies, thus interfering with the efficient operation of the technical bureaus of the government.

Because of the far-reaching results that might ensue and because of the seriousness of the situation, the organized engineers and technical men of the United States are preparing to make a thorough search into the considerations that led to the action taken in regard to the Reclamation Service. The American Society of Civil Engineers has appointed a special committee to investigate the matter.

The evident interest and concern among engineers and technical men regarding this situation, as well as their views, may be gleaned from the strong editorials that have and are appearing in the technical publications regarding it.

Under the heading, "A Disheartening Dismissal," Engineering News-Record said, in part, as follows:

"No move ever made has been more destructive of the morale of the engineer in the federal service than the peremptory ousting of Arthur P. Davis as director of the United States Reclamation Service. * * * * What is in the mind of the Secretary of the Interior in this dismissal it is not permitted us to know. He takes refuge in the sole statement that he prefers to have reclamation work in charge of a business man rather than an engineer, but in order to avoid the necessity of showing wherein the engineering control has been unsatisfactory he abolishes the office of director and substitutes a new one of commissioner, thus depriving the automatically removed director of a hearing on his dismissal. And to succeed this engineer, who has grown up in the service, one of the most competent men in both the science and business of reclamation in the world, the secretary—a doctor of medicine, whose life work has been the conduct of an asylum for the mentally deficient—appoints a not too successful country banker who has been a governor of Idaho. Is there any reason why the charge should not lie that the administration politicians want to have the leverage of the Reclamation Fund to use where it will do the most good?"

The work of the Reclamation Service is essentially engineering and technical. There are business aspects, to be true, but so far as is known there has been no criticism of the business direction of the service, other than perhaps by certain interests in the West who have endeavored to secure a reduction in or have endeavored to repudiate payments for reclaimed lands purchased.

Should this demand prevail, the fundamental principle of the enabling act will be displaced and the revolving fund for the continuation of the work will be dissipated, so that other needed projects cannot be carried out unless there be additional drains upon the Treasury of the United States. Furthermore, should such an eventuality ensue public confidence in the integrity of the direction of such work would be so shaken as to make it difficult to secure appropriations from Congress to extend the work of reclaiming the arid lands of the West.

In the main, the support for such has come from the West, but should there be a question as to the wisdom with which the projects are selected and executed then it is entirely probable that the West would not receive support from other sections of the country. Therefore, not only is the morale of the technical service at issue, but also the larger thing, perhaps reclamation itself.

It is these considerations that are causing organized engineers and technical men to make a thorough study of the situation. Undoubtedly, pronouncements will be forthcoming as the result of such study.

"The average citizen has become so accustomed to the services the utilities render that now he merely takes them for granted, and the gravest mistake that has been made by our public service executives has been their long submission to this state of public indifference. Many of the woes of the public service corporations today may be attributed to the folly of their officers in assuming that their service was only to be offered on a come-and-get-it basis instead of being merchandised. The belief of the utility manager that his enterprise is a business apart, and that the proved and accepted principles of every-day commercial practice cannot be successfully applied to it, is responsible for many of the legislative restrictions and current beliefs that now hamper utility operations."—Floyd W. Parsons.

CURRENT COMMENT

California still leads all states in the Union in the production of hydroelectric energy. This fact is shown in the annual report of the division of power resources of the Department of the Interior, which has just been issued. The figures show that California produced 3,776,998,000 kw-hr. of hydroelectric power in 1922, that amount being 22 per cent of the hydroelectric energy produced in the country that year.

California Leads in Production of Hydroelectricity

California ranked second to New York in hydroelectric production in 1920, but moved up to first place in 1921, and has retained her rank for 1922.

California is the only state that uses no coal for the generation of electricity. It does use more oil for this purpose than any other state, although its oil consumption in this connection is decreasing, the figure for 1923 being 2,700,000 barrels, or considerably less than half the number of barrels consumed in 1920.

Although it has only 3.3 per cent of the total population of the United States, California produced 9.2 per cent of the total amount of electricity generated in the country in 1922.

Arizona's reasons for her seemingly obstinate stand with reference to the Colorado River pact were ably explained in a letter from one high in the affairs of that state which was read by Governor James G. Scrugham of Nevada before the Western Development Conference, held in conjunction with the recent convention of the Pacific Coast Electrical Association, in San Francisco. To quote from the letter:

Arizona's Stand on Colorado River Explained

"There is no desire in Arizona on the part of anyone to delay the development of the Colorado River. Our mining industries need power. Yuma needs flood control and several of the prospective agricultural valleys need power for pumping. Consequently, we are in need of early development. The Federal Government owns too much of our territory. Here in our state they have reserved mineral rights and nearly all of our timber, all of our coal and water power sites, and have kept up the fiction that the Colorado River is a navigable stream. Coconino County in this state is the second largest county in the United States and the government owns 90 per cent of it. It is going to be necessary, if we are to have a state down here, instead of a number of boroughs for different cities throughout the country and different corporations to exploit, that the resources which have been put here by Nature, capable of sustaining the population, be used to secure those advantages.

In the lower basin, Arizona occupies relatively the same position as does Colorado in the upper. California and Mexico will develop much more rapidly than this state, and unless an apportionment of the benefits of the river is made in the lower basin, Arizona is going to wake up and find that its greatest resource has been appropriated by California and Mexico.

"There are two questions involved in the matter: irrigation and power. There is a theory in Arizona, which will probably either be sustained or proved impracticable within the next few months, that two and one-half milions of acres of land can be irrigated from the water in the river and that if this is true there will be no water for Mexican land. If Mexico, which will inevitably develop sooner than Arizona can, puts the water to beneficial use, our opportunity will be lost."

The objection which is of greatest importance to the electrical industry here in the West is contained in the next paragraph of the letter, which states:

"Then the power question: We believe that if California can charge us for oil and New Mexico for the coal produced within her borders, Arizona can charge California for power developed within our borders. We are anxious that our rights to do so be established before development is undertaken. The matter of the location of these damsites is of considerable importance to this state. It is generally agreed that whoever first develops power and puts in a distributing spstem will inevitably get the monopoly. There is a strong sentiment in Arizona for states' rights, and the terms which were exacted from this tate when she was admitted to statehood, which deprived her of the benefits of the great natural resources within her borders, impels many of our citizens to undertake to get for the state all that is possible from the development of the river.

"There is a strong sentiment here greatly antagonistic toward permitting Los Angeles and southern California to obtain the benefits that are naturally attached to those who put in the first power installation. There is also a very definite sentiment that power works on the river should be owned by the State of Arizona, that is, those that are wholly

within the state, and that the advantages to be obtained from them go to the state."

Now, while Arizona seems to have effectively blocked action on the Colorado River treaty for the time being, at least, the Federal Power Commission has inserted the thin edge of a wedge which is expected to lead to action on some of the Colorado River projects. By granting the Utah Power & Light Company a preliminary permit for its Flaming Gorge development, the Commission has scouted its resolve to delay all action on these applications until the pact has been ratified. The belief is general that the Commission will award the Girand license for the Diamond Creek development on the river not later than this fall. It is also believed that the upper states can no longer insist that the Arizona project be held up when they have urged the granting of the Flaming Gorge permit. Needless to say, the entire situation is one in which future developments will be watched with interest.

Interest in Radio Being Maintained

For many reasons interest in radio is likely to be maintained this summer to a far greater extent than last year, accoring to the radio experts of the Bureau of Standards. The maintenance of this interest and of good radio business during the summer depends very largely on the broadcasters and radio dealers. Two elements of radio receiving sets which have been perfected during the last year or two have gone far to help in making it convenient and satisfactory to use radio receiving sets outdoors. The first of these is the dry battery tube, that is, electron-tube detectors and amplifiers which require only a small dry battery rather than a heavy storage battery to light the filaments. The second improvement is the development of more satisfactory loud speakers which furnish a considerable volume of sound without undesirable distortion. Thus it is possible now with small portable receiving sets, which can be purchased, or which can be fairly easily assembled, to receive satisfactory radio broadcasting while out camping or boating, or making automobile tours. It is a noteworthy fact that exploring parties now take radio receiving sets with them for the dual purpose of furnishing amusement during the evening hours at camp and for receiving time signals with which to check their chronometers.

While the increase in the number of broadcasting stations in operation is an important factor in the radio situation this year, a still more valuable feature from the viewpoint of the listener is a very notable improvement in the quality of programs and other features of operation of broadcasting stations. There are now about thirty Class B broadcasting stations operating on individually-assigned frequencies between 1,000 and 550 kilocycles (300 and 545 meters). These stations furnish programs of high quality and employ transmitting sets of 500 to 1,000 watts power in order to secure the privilege of frequency assignment in this band. The large number of Class A broadcasting stations are also distributed over a range of frequencies from 1,350 to 1,050 kilocycles (222 to 286 meters). A number of these stations, as well as some of the Class C stations operating on 833 kilocycles (360 meters), have well designed transmitting sets and carefully selected programs. The assignment of broadcasting stations to frequencies differing by at least 10 kilocycles, in accordance with the recommendations of the Second National Radio Conference, has resulted in a decrease in interference and an improvement in the quality of broadcast service which is obtainable by the average listener.

Industrial Use of Electricity Is Increasing

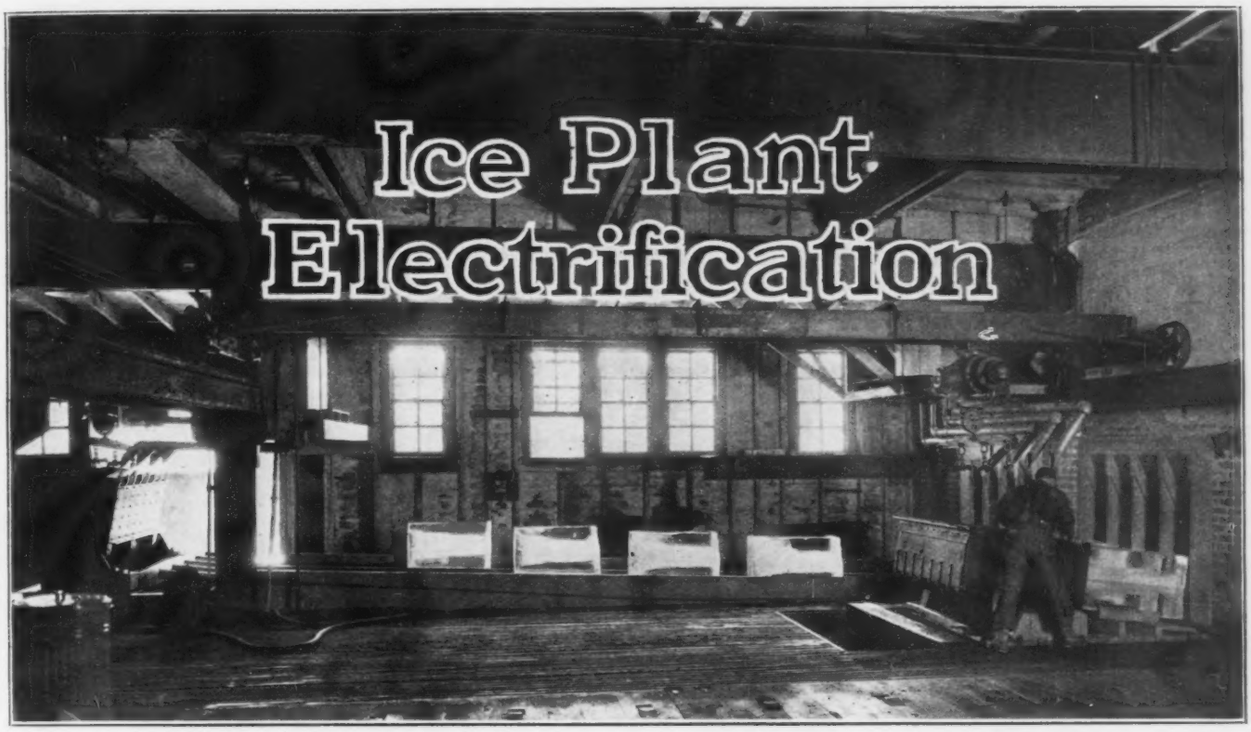
The substantial increase in the use of electric power for manufacturing purposes in northern California during the past few months affords a logical basis for anticipating a future expansion of business at a pace surpassing even the unusual growth of the past few years, according to a statement which has been issued by A. F. Hockenbeamer, vice-president and treasurer of the Pacific Gas & Electric Company. In his statement, Mr. Hockenbeamer says:

"The Pacific Coast, favored by climate, by a variety of raw materials and an abundance of motive power, is steadily winning recognition as a most promising field for industrial activity. Established industries are enlarging their facilities and new factories are being started almost daily, and in practically every branch of this quickening of industrial life in the company's field of operations electricity plays an important part. Indicative of the constant broadening of the field for this company's service, it may be noted that in the month of May 5,252,703 kw-hr. of electricity were sold to the manufacturing industry in excess of the sales in the same month last year, an increase of 29.43 per cent, and undoubtedly one of the biggest gains in sales to this class of business ever experienced by the company. A kilowatt-hour of electricity is equivalent to the energy expended in a day by an able-bodied man doing the hardest kind of physical work, so that in the month of May alone this additional amount of energy sold by the company for manufacturing purposes is equivalent to over 5,250,000 men-days of labor.

"Sales of electricity for miscellaneous power, heating and cooking also showed the very substantial increase during May of 2,268,901 kw-hr., or 27.05 per cent, a result largely of the active campaign for the greater use of electric appliances which has been carried on by the company's enlarged sales organization. In the five months that ended May 31, 1923, total sales of electricity to all classes of consumers increased 48,609,286 kw-hr., or 12.05 per cent.

"The number of customers connected to the company's lines on May 31, 1923, was 664,011, an increase during the year of 53,944. In the five months ended May 31, 1923, the net addition of new consumers was 18,747, compared with 11,098 in the first five months of 1922."

WINDOW displays such as these, illuminated in colors, with an intensity of 400 foot-candles, have enabled Max Cahn, Fresno merchant, to cut his advertising appropriation fifty per cent. If each and every merchant in a city could be convinced that light is an invaluable silent salesman, the profit to central station, fixture manufacturer, lamp manufacturer and contractor-dealer would run into thousands of dollars annually. Better store lighting is an untouched treasure chest of neglected opportunities for every branch of the electrical industry. It is a field for immediate cultivation.



Ice Plant Electrification

By H. L. Lincoln
Superintendent of Factories, Union Ice Company

ELECTRICITY has made possible the small ice plant of 15 to 30 tons capacity. Mr. Lincoln describes the strides which have been made in ice plant electrification and discusses the advantages of this type of load to the central station. He estimates that proposed new construction will require an additional 12,000,000 kw-hr. during 1923.

DURING the past year a number of notable hydroelectric generating stations have been put in service in California, and recently additional installations have been announced, made necessary by the large increase in industrial requirements. Not only does this bear witness that the manufacturers of California believe in the economy and reliability of power company service, but it also induces confidence by demonstrating the resources behind the meter.

In all sections of the state new factories are being built to supply the requirements of a rapidly increasing population. Nothing shows this more strikingly than the number of ice plants built and building for the present season's business. A survey of the state shows new plants in Oceanside, Long Beach, Wilmington, Los Angeles, Monrovia, Alhambra, Glendale, Taft, Dinuba, Turlock, Newman, Santa Rosa, Stockton and San Rafael, with additions made to existing factories in San Diego, Los Angeles, San Bernardino, Bakersfield, Fresno, Sacramento, Stockton and Roseville. These increases in plant capacity call for an addition of nearly 3,000 hp. to the power lines distributed between San Diego and Roseville. As ice plants must be operated at a uniform load twenty-four hours a day, the load factor will be very high—many months in the year eighty or ninety per cent—with an average for the entire year above sixty per cent. This means that some 12,000,000 kw-hr. will be added to the annual output of the power companies. Table No. I indicates the distribution of new ice plants in the state during the past six months.

While the amount of electrical equipment used in ice plants, under more or less special and abnormal conditions, presents many interesting characteristics, the most noteworthy feature is the very large percentage of electric-driven plants, further emphasized when it is remembered that only a few years ago ice manufacturing was just as dependent upon steam power. The plant of fifteen years ago required distilled water for ice making, hence a boiler room and, quite logically, steam engines for supplying power. As a result the overhead expense on a small plant was very great and large factories were usually built. The smaller communities could be served only by rail shipments from these producing centers, resulting in a heavy meltage and large loss of a product manufactured at high cost.

Increased Range of Application

With the perfection of electrically driven plants, a smaller size unit has been developed and is being successfully operated as evidenced by the many factories of fifteen to thirty tons daily capacity installed this year. The most obvious benefit from this smaller plant is to the user of ice who obtains a product fresh from the factory, not damaged by rough usage in shipping. The power company has obtained

a high load factor customer and at the same time the manufacturer saves not only the meltage but has also reduced the non-producing part of his plant. The motor-driven compressor can virtually be placed in the same room with the freezing tanks, saving the entire cost of building for the boiler room along with its equipment. Practically the entire attention of the operating men can be concentrated on profitable production instead of maintenance of furnace efficiency or the desired vacuum. The engineer's duties have thus broadened from those of an operating man and mechanic to a production man with a much clearer appreciation of the requirements of the distribution department.

Tank room of the Mutual Ice Company, showing the electrically operated can hoist and the modern method of illumination, using R. L. M. reflectors.

Fifteen years ago the art had not progressed sufficiently to make merchantable ice from the usual water supply known to the trade as raw water ice. It was necessary to distill the water to be frozen and as the amount of distilled water required exceeded the steam used in the engines driving the compressors, there was little incentive to develop mechanical efficiency, the engines practically functioning as reducing valves to supply water to the condensers. Unfortunately the steam was polluted with cylinder oil, requiring separators, skimmers and various forms of filters to insure merchantable ice. In spite of all care, however, only too frequently some oil was carried over into the ice cans, to be deposited in the customer's refrigerator or appear in a glass of ice water.

Before raw water could be frozen into merchantable ice, some of the earlier electric plants used complicated evaporators to furnish the distilled water. When it was possible to eliminate these the ice industry adopted the electric type of plant as standard construction. The problem was solved by treating the water chemically before placing it in the cans and then keeping it in motion while freezing, accomplished by blowing air into the bottom of the can.

Ice Plant Operation

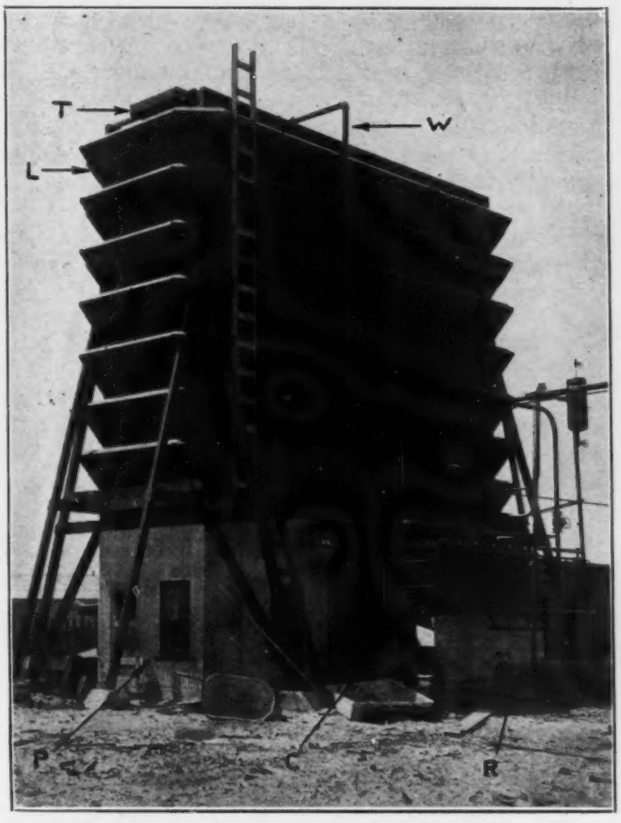
The operation of the present day ice plant consists of the following steps: If the raw water contains a large amount of dissolved solids, as most California water does, it is treated with some form of softener to remove the solids in solution and then poured into the cans, usually weighing three or four hundred pounds, to be frozen. These cans are placed in a tank of brine where a temperature of about fifteen degrees is maintained. The brine is cooled by ammonia coils, the ammonia being supplied to the coils in liquid form. As the ammonia evaporates, the compressor pumps it into the condensers where it is again converted into a liquid by a constant and very considerable flow of cold water.

Sometimes this water can be obtained from a shallow well and again it is necessary to drill several hundred feet into the ground. Even then the supply may be insufficient and it will be necessary to use some means of cooling the water so that it can be circulated over the condensers again and again.

There are many types of apparatus used to cool water that involve the basic principle of evaporating a small portion to cool the rest. Whatever design is used, the water must be broken up into small drops and brought into contact with a large amount of air. When the relative humidity is low, fifty per cent or less, water can be cooled many degrees below the temperature recorded by an ordinary thermometer on a hot day. In some localities when the thermometer in the shade registers 95 deg. F., the water will fall from the tower at 70 deg.

The accompanying illustration shows a typical arrangement of ammonia condensers with a receiver drum to receive the liquid, placed below the cooling

tower, and a house for the water circulating pump adjacent. In a factory making thirty tons of ice a day, such a tower must cool 150 or 200 gal. of water per minute all day long. Usually a direct-connected, motor-driven, centrifugal pump is placed close to the tower basin to lift the water to the distributing troughs at the top. It then falls through ten or twelve screens of galvanized wire and is so broken up that it reaches the bottom in a fine mist. The prevailing wind carries a large volume of air between the louvres and through the mist which is cooled thereby. As the climatic conditions in California are



Modern water cooling tower. The symbols indicate the following parts: T, distributing trough; L, louvres; W, water line to tower; P, pump house; C, ammonia condenser; R, ammonia receiver.

particularly favorable in the summer time—the humidity being very low when the temperature is very high—the water from a well designed tower is usually cooled to below 75 deg. and, as the quantity is only limited by the size of the pump, economic operation is made possible.

Electrical Equipment

To drive the machinery of a typical thirty-ton plant, the following motors will usually be found:

Ammonia Compressor quite similar in construction and operating characteristics to an air compressor, usually running at a speed of from 100 to 160 r.p.m., and driven by a 60-hp. 600 to 900-r.p.m. motor usually of the squirrel cage type.

Blower, or Air Compressor, to furnish air to keep the water in motion while freezing, at a pressure in the low pressure system of about three pounds, driven by a 7½-hp. motor. In the high pressure system, a pressure of 25 pounds will be maintained, requiring a 15-hp. motor.

Condensing Water Pump of the centrifugal type, with a capacity of 150 to 200 gal. per minute, is usually direct connected to a 5-hp. motor.

Brine Agitator to keep the brine in the tank circulating, usually of the propeller type, either belted or direct connected to a 3-hp. motor. Sometimes two such agitators are installed.

Ice Hoist mounted on a traveling crane, with a lifting capacity of ½ or 1 ton, usually of a special design, to lift the ice cans from the tank, requiring 2 hp.

Well Pump, of a type depending on the depth of the well, sometimes being the condensing water pump above mentioned. However, when the water must be lifted 50 ft. or more a deep well turbine pump or air lift may be required.

With the exception of the hoists, all of these motors are operated 24 hours a day, month after month, with practically no change in the load. As a result, motors can be selected to run at full load, although the ammonia compressor motor must be capable of carrying a slight overload for a few hours,

Table No. I.—Electrification of Ice Plants in California First 6 Months, 1923

LOCATION	Installed Capacity—tons of ice daily	Hp. Connected	OWNER
San Diego	40 additional	150	Mutual Ice & Cold Storage Co.
Oceanside	15	60	The Union Ice Co.
Long Beach	60 additional	175	Home Ice Co.
Wilmington	30	100	The Union Ice Co.
Los Angeles	50 additional	150	Ice Distributing Co.
Los Angeles	15	50	
Los Angeles	60	150	The Union Ice Co.
Highland Park	30	100	Pasadena Ice Co.
Glendale	30	100	The Union Ice Co.
Taft	30	100	Citizens Ice Co.
Taft	30	100	Central Cal. Ice Co.
Bakersfield	12,000 storage		Santa Fe R. R.
Dinuba	15	55	Central Cal. Ice Co.
Fresno	50 refrigeration	75	Fresno Consumers Ice Co.
Fresno	8,000 storage		Peoples Ice Corp.
Turlock	15	55	Central Cal. Ice Co.
Newman	15	55	National Ice & Cold Stor. Co.
Sonora	15 (changed from steam.)	50	Sonora Ice & Cold Storage Co.
Stockton	10 additional		
	1,200 storage	50	The Union Ice Co.
Stockton	75	300	Valley Ice Co.
Sacramento	7,600 storage	75	Consumers Ice & Cold Storage Company.
Roseville	300 additional	1,000	Pacific Fruit Express Co.
Vallejo	20	75	San Pablo Ice Co.
San Rafael	15	60	Marin Ice Co.
Santa Rosa	50	150	National Ice & Cold Stor. Co.
Plants using gas or oil engines			
Monrovia	30	100	Pasadena Ice Co.
Needles	350	1,200	Santa Fe R. R.

occasionally. Obviously, such motors run at their highest efficiency and power factor, both probably nearly 90 per cent—a marked contrast to the average industrial plant, where often many motors carry no load or only a very light load many hours a day, with the power factor proportionately reduced. The latter condition lowers the power factor of the individual factory and places a drag on the entire system, thus reducing the capacity of the transmission

lines connecting the industrial centers with the mountain generating stations. If sufficient inducement were offered the ice manufacturers to use the more expensive and less rugged synchronous motors, the ammonia compressor presents an opportunity to still further correct this condition and, by eliminating the wattless watts, build up the system power factor and render more power available for other users.

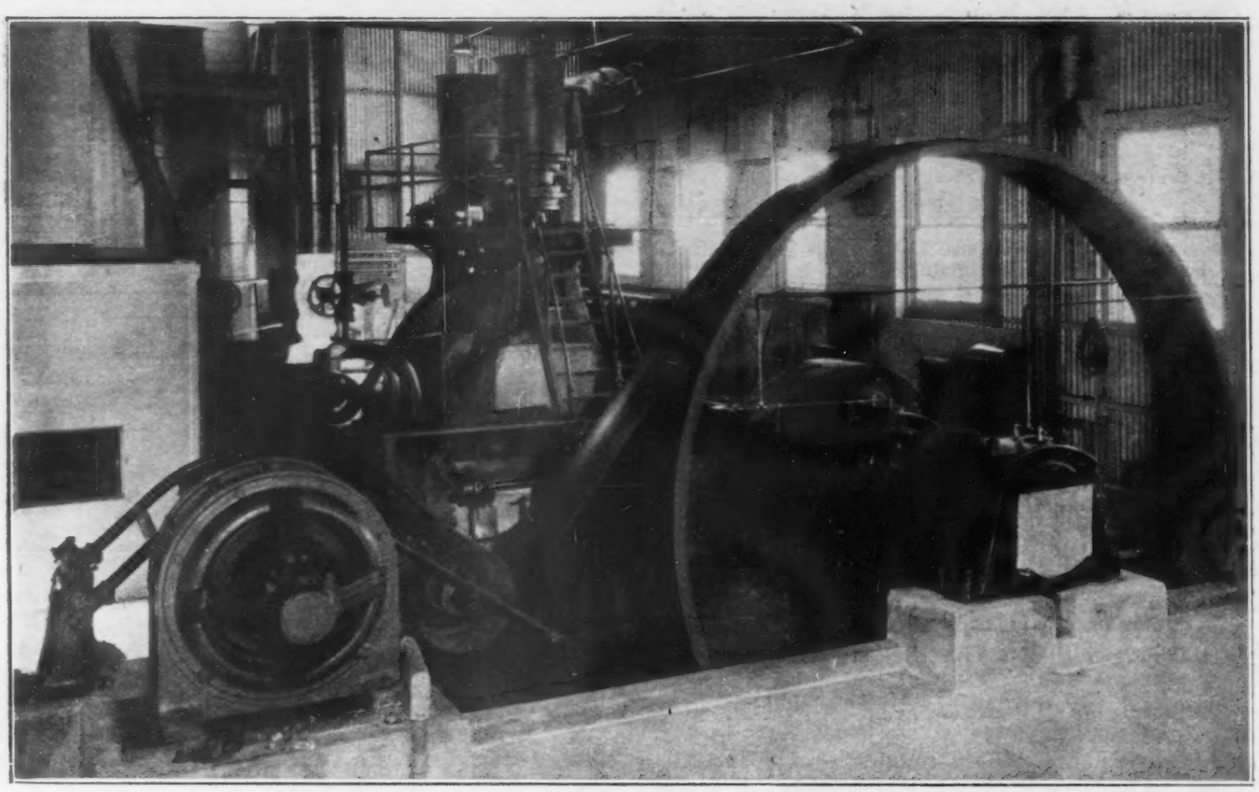
It seems obvious that if an industrial load can be developed that will use power factor correcting apparatus, it will benefit all users of the service by saving the power companies the investment in electrical condenser equipment such as is now required to hold up the power factor of the distributing systems.

Plant Illumination

In addition to the high-quality, long-hour service developed by the motors, a large quantity of electricity is required to light the factories. As the process is continuous, it requires the factory to be lighted for long hours; in fact, the lighting load has a load factor much higher than that of many users of motors. Even so, it is a field that has been practically neglected by the illuminating engineers, so that frequently, particularly in the older plants, the lights may be said to serve as guides rather than to illuminate the work. Recently, considerable improvement has been made by taking advantage of the industrial reflectors now available. In the compressor room the selection is quite simple, requiring general lighting of relatively low intensity, but concentrated in the active sections of the room. In the storage rooms there is no necessity for accurate work and as the frost-covered ceiling and the ice itself are virtually reflectors, a small amount of light is adequate for the work.

The condition is somewhat different in the tank room where the ice is frozen. There the light should be evenly distributed with an intensity of from 2 to 2½ foot-candles at a lighting plane 6 in. below the floor. This will be found only in the more recently built factories, the older ones often averaging less than half a foot-candle. The character of the work is such that an even distribution is desirable, but there is no operation calling for close measurement, so that the high intensity frequently recommended for industrial plants is not necessary. In the accompanying illustration the R.L.M. type of reflector is shown installed in a factory that manufactures 80 tons of ice per day. The tank room is about 32 ft. wide by 110 ft. long and is brilliantly illuminated by 200-watt lamps. In another factory a tank of the same width, but 60 ft. long, is adequately illuminated with 100-watt lamps with similar reflectors, there being six of these units. In smaller factories, where the width of the tank is less, a single row of lights gives satisfactory illumination.

From the foregoing it is apparent that whatever is the point of view—lighting, motor application, mechanical apparatus, or electric service—the ice factory offers an opportunity for engineering study for the purpose of improving methods and conditions prevailing in this large and well established industry that is demonstrating its desire to keep up with the demand of the times, both as to installed capacity and the use of most approved equipment and methods.



Motor-driven compressor in the plant of the Mutual Ice Company, San Diego.

Light That Sells

By H. H. Courtright
Manager, Valley Electrical Supply Company, Fresno, Calif.

MERCHANTS in all communities are sensing the great psychological value of light in increasing prestige for their stores, and its practical value in selling the goods once the prospect has stopped to examine them. Better store lighting has become, like advertising, one of the merchant's easiest steps towards better sales. Light has been demonstrated to be the best tonic for speeding up business. The merchant has learned that good light in the store interior and in the display windows increases the average amount of goods sold per customer, decreases the goods returned, causes fewer complaints, brings more buyers, promotes greater cleanliness in the store, requires less time to make sales, and induces more courteous attention from the sales force.

Where the electrical industry has been talking intensities of 10 foot-candles in the store interior and 40 to 100 foot-candles in the store windows, the progressive merchant is in the proper frame of mind to listen to arguments for intensities two or three times greater than common practice dictates. The Wonder Cloak and Suit House, a ladies' ready-to-wear department store, in Fresno, Calif., has recently moved into a new building, which is conceded to be one of the most modern in the United States in lighting equipment and which conclusively demonstrates that the present-day merchant is fully aware of the value of light to his business. One of these merchants is Max Cahn, whose farsightedness did not allow him to forget light as a sales agent, and who made it one of his first tasks to consult an illuminating engineer while the new store was yet only a vision.

Before launching into a description of some of the details of this equipment, it might be stated that the store interior has a lighting intensity of 18 foot-candles, while the show windows have an intensity of 400 foot-candles. The effectiveness of the illumination is demonstrated in the accompanying views of the store windows and the interior.

The lighting of the show windows is so designed that various color effects or light intensities may be secured by merely closing master switches, which are provided with dimmer loops for the future installation of master dimmers. Two banks of lamps, placed 12 in. apart in the main windows, are so wired that every third lamp, every second lamp, or all, may be turned on at one time. The lamps are placed 12 in. apart and are mounted in X-Ray reflectors. The lower row of lamps is provided with a special metal frame to carry color screens.

An examination of the accompanying diagram of the show windows and a portion of the main sales floor shows that the main window at the corner of Tulare and J Streets has an area of approximately 620 sq. ft., illuminated by 15,450 watts, in lamps consisting of 103-150-watt X-Rays arranged for three intensities or colors. This does not include an adjustable spotting bank of 1,800 watts, in 12 X-Ray units, or a 600-watt bank of footlights. In the less important windows the installation is not so large. A further examination of the diagram will show that in the small island windows the number of watts per foot is even greater than in the main windows, as there are no walls to act as reflectors and to confine the light.

A view of the display windows of The Wonder, howing the effect of a 400 foot-candle intensity.

Details as to the arrangement of the reflectors and the construction of the steel frames of the color screens are also shown on the diagram.

Sufficient convenience outlets have been installed in the windows for the use of floor lamps or any other appliance needed in the window trim. Elixits have been installed where the fixtures are attached, so that these may be changed from time to time should the window trimmer desire. B. C. Hampton, display manager for The Wonder, accredits much of the success and beauty of his window displays to the capacity and flexibility of the electrical illumination, which he likens to a first-class stage equipment.

That equipment of this character constitutes an added incentive for creating original window displays is demonstrated by the fact that the two outing windows which are reproduced as a frontispiece for this issue won for Mr. Hampton, the display manager, first prize in a recent window display con-

test conducted by the International Displaymen's Association. Photographs of decorated windows from all parts of the country were entered in the contest, first prize in which was a gold medal. No pictures, however, could reproduce the color effects

Glare and shadows are eliminated in the fitting and dressing rooms by the employment of a novel scheme of indirect lighting.

which were secured by Mr. Hampton through the use of the lighting equipment.

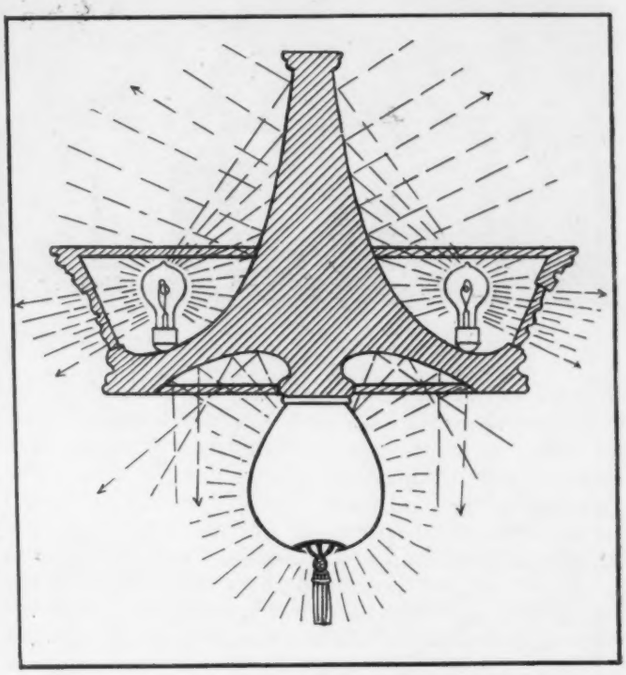
In the store interior special fixtures were designed to fit the needs where stock fixtures were not available. Too often the better class of store derives its major illumination from some ornate luminaire designed for decorative purposes rather than for lighting purposes. In the case of The Wonder, this is not the case, and while the fixtures harmonize with the decorations, they are strictly utilitarian and provide the maximum amount of illumination. The four main fixtures weigh 400 lb. each and combine the features of both direct and indirect lighting, providing two distinct shades and intensities. The accompanying drawing shows a cross-section of one of these fixtures. For convenience of cleaning and re-lamping, all main ceiling units are suspended on cable hoist equipments, with automatic contractors, doing away with ladders clogging the sales floor, should it become necessary to change a lamp or luminaire during the sales hours.

All interior show windows and glass show cases are provided with continuous reflectors, so as to amply illuminate the articles on display. Throughout the store, 600 ft. of these reflectors are used. Each show case has an individual switch, so that the clerk in the department where the case is located is responsible for seeing that the current is turned off each night.

In the special display rooms more ornate fixtures are employed, as is indicated in one of the accompanying illustrations.

A feature of the lighting installation is the method employed to illuminate the dressing and fitting rooms. An absolutely new illumination feature is achieved by indirect lighting. As the dressing room door is closed, the room is flooded with clear, white light, free from shadows or glare. A 300-watt "Litekraft" reflector unit is placed directly over each of the two mirrors and is trained on the ceiling. Shadows are entirely eliminated and the dressmaker or fitter is not bothered by glare, as has been the case in the past. The mirrors are offset from the wall and are placed at an angle, so that it is possible to get a back and front view of the gown or dress which is being fitted without turning the body. This feature of the installation has already attracted considerable attention and has been studied by several of the large stores in other cities in California.

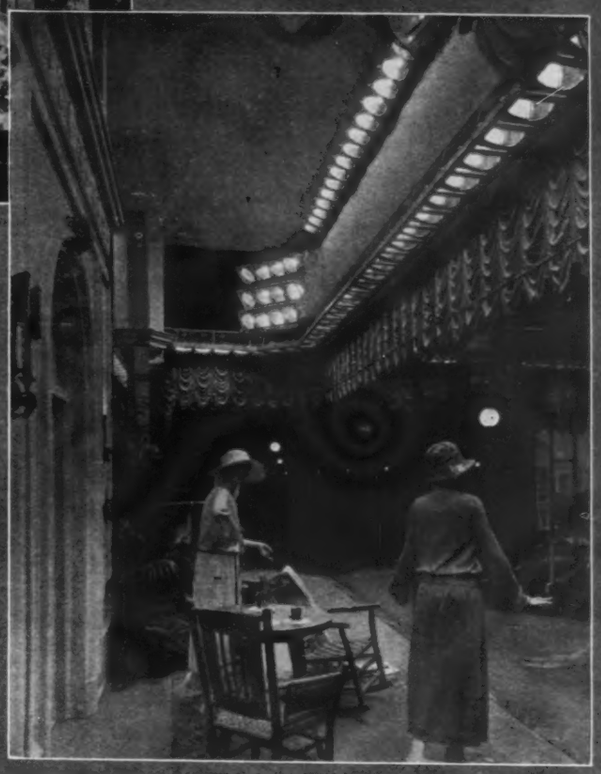
The primary lighting of the basement, where a cheaper line of goods is displayed, is secured entirely



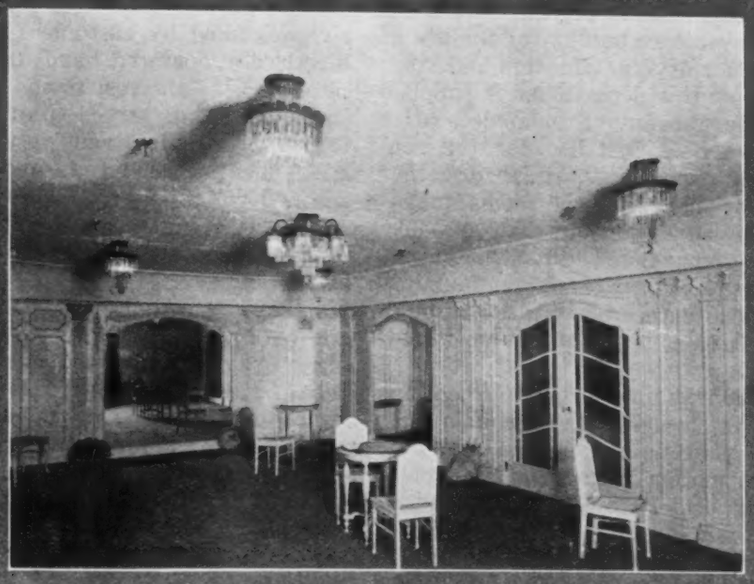
Cross-sectional sketch of one of the luminaires in the main sales department.

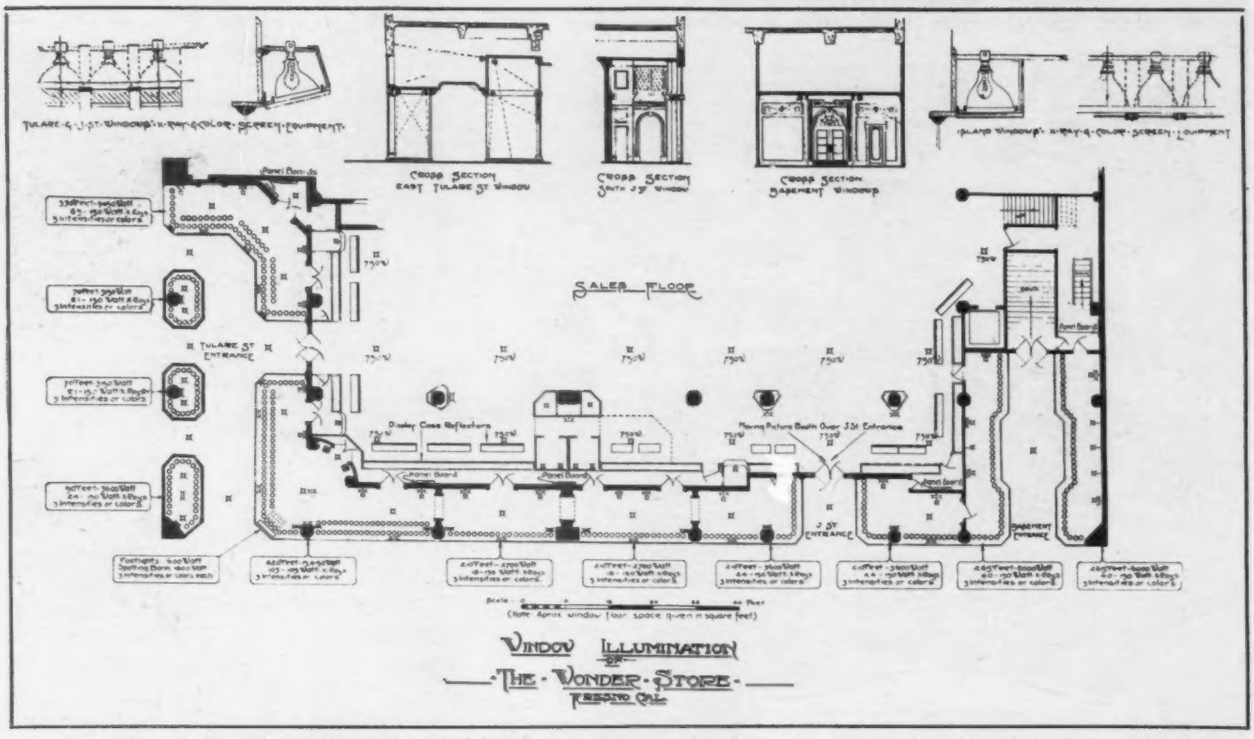
from indirect cove lighting. Powerful X-Ray units are set in troughs around the columns supporting the ceiling. Supplementing this primary system is a system of direct lighting, consisting of a series of bowl-type luminaires, used to increase the intensity on special days of sales.

The wiring features are designed to give control of the many lighting effects from various points in the store, with a master switchboard at the foot of the basement stairway. Steps have been taken, so



THE upper picture shows the main sales floor when an intensity of 18 foot-candles is maintained through the use of proper luminaires. View on the right shows the method of installing the reflectors in the corner display window. The spotting bank is shown in center of picture. The lower picture shows the French Parlor, one of the more exclusive sales rooms.





Detailed plan of the illumination of the show windows and main sales floor, showing the location of the X-Ray reflectors.

that the store may be lighted in case the a. c. service which supplies the building should fail. A small motor generator set is installed in the basement, together with a sufficient number of storage batteries to supply an emergency d. c. lighting circuit for several hours. The emergency lights are located at vantage points throughout the store.

Floor plugs and convenience outlets are located at various points throughout the building where decorative lamps or cleaning apparatus may be connected with a minimum of extension cords.

Special electrical devices are installed in the manicuring, hair dressing and beauty parlors on the second floor. Each of the many private booths has from five to eight convenience outlets for the use of violet-ray machines, hair dryers, vibrators and other devices. Hot water for this department is supplied from an electric water heater. Special decorative lighting fixtures have been installed for the convenience of the beauty specialists, which, together with the original color scheme of the rooms, makes the place more like milady's boudoir than a beauty shop. Miss Mina Ring, manager of this department, is well pleased with the radical change of illumination met at once as one enters her parlors through the store. This department is one of the most modern in the country.

A standard motion picture projection booth is installed over the J Street entrance to the main sales floor. The machine has been provided for use during fashion shows, when motion pictures of the latest styles from New York and Paris may be flashed on a screen hung from the mezzanine floor. Spot lights are also installed in the projection room and on the mezzanine floor to illuminate the models who are displaying gowns during one of these fashion shows. Remote control swiches to turn off all lights in the main sales room are also located in the booth.

The electrically operated air cooling and washing equipment is located in the basement and the penthouse. The air may be changed throughout the store every three minutes. Owing to the fact that Fresno is located in the interior valley, where the temperature often reaches 100 deg. F. in the summer months, refrigerating apparatus is installed for cooling the air. Immediately behind the air cooling and washing equipment is installed a high frequency ozonator apparatus to additionally clean the air and precipitate surplus moisture, assuring the store fresh air, welcomed by customers and sales force alike. Electrically operated hand drying machines are located in all of the rest rooms and toilets.

The store is served from a special set of transformers located in a vault in the basement. Current is supplied at 2,300 volts and stepped down to 220 and 110 volts.

A 28-ft. high electric sign is located on the top of the eight-story building in which the store is located.

That an installation, such as The Wonder, constitutes a powerful selling argument for better lighting has already been demonstrated. Its effect has been felt in Fresno, for enterprising merchants, aware of the increased business which has resulted, are already planning improvements to their own stores. Interest in the installation has been aroused in both Los Angeles and San Francisco and illumination engineers from these two cities have inspected the store and cite it as one of the most modern in the country to their prospective customers.

Science Provides Modern Ally for Director of Film

HANDLING the vast crowds of a motion picture spectacle, involving the minute direction of thousands of "extras" in mob scenes, has been reduced from one of the gravest problems that confront the film producer to one of the simplest operations in his hectic calling. Electricity has smoothed his path toward realism, and the microphone and loud-speaking telephone, operated by power amplifiers, have cut away with one sweep the bonds that once held him to days of painstaking rehearsals, and disappointing fiascos that of yore cost thousands of feet of spoiled negatives.

The most perfect example of what amplifiers can do for the picture producer is seen in the production of "The Hunchback of Notre Dame," a super-production being filmed at Universal City, Calif. Its cast

Howard Santee, Western Electric Amplificationist, and Wallace Worsley, motion picture director, examining the voice amplifier used in connection with the production of the "Hunchback of Notre Dame."

of nearly five thousand people, working in a setting that covers more than nine acres, are perfectly directed by the most complete installation of its kind ever devised for such work.

The basis of the system is a Western Electric No. 2 public address system. To adapt it for use on a film set, various special features have been added to it.

Two boards control the apparatus. One, the power control, handles the current, generated by a motor generator installed in the building that houses the boards, and actuated from the 110-volt line current on the premises. The plate voltage is 350 and the filament 18.

Eight transmitters were supplied with the system, usable at any point in the big setting. By means of a control switch in the switchboard house the director can be connected to any point at once. In the control room is a monitor horn, by which the operator can instantly detect the condition of the apparatus, and twelve Western Electric 6A horns, connectable in multiple, are distributed at the important points. These are specially designed for this type of work. Three are in multiple over the big replica of Notre Dame Cathedral, the rest in and about the old buildings on the Paris streets reproduced in the setting.

Seven circuits lead off the volume control switchboard for the twelve horns and any number may be connected for any special needs. In the control house is a potentiometer control ranging over twenty-four points to regulate distance of carrying. Each reproducer has in addition a rheostat control.

The volume indicator in the control house is an innovation in this type of system. It operates on a new principle, and is in effect a galvanometer showing fifteen points on proper regulation.

A field telephone set enables the director on the scenes to talk back to the switchboard in case of any derangement of the apparatus.

The first three steps of amplification are single, and the fourth or final is a "push-pull" arrangement —in effect power amplification.

Radio messages can be received by use of a radio receiver, and amplified over the board and broadcasted in the same manner as the director's messages are transmitted.

The uses of the set on the picture lot are manifold. Most important of course is the work of directing the mob scenes, one director in the tower being able to direct any part of the crowd.

The "inspirational music," a valued adjunct to acting for films, is also broadcasted for the crowds of players over the apparatus. In fact, the set has made possible for the first time in film history the use of music in mob scenes. Radio concerts between waits are given the crowds of actors, too, thus strengthening morale and creating an esprit de corps that alone has saved a small fortune in the big picture, according to Wallace Worsley, director, and Lon Chaney, star of the production.

The entire installation cost in the neighborhood of seven thousand dollars and its saving has paid for itself many times over. The picture is "the largest ever filmed," and includes seventy-five principals augmented by a vast army of extras, so it can be seen that any saving of time, even in moments, means big sums of money.

The installation was made by Howard B. Santee, Western Electric engineer who came from New York for the work; Major Nathan Levinson, Western Electric amplification specialist, and G. E. Anderson, engineer for the Pacific Telephone Company, Los Angeles district, assisted by the Universal City electrical department staff.

Public Relations Is Theme of Northwest Convention

PUBLIC relations and the attitude of the public toward the utilities were the keynote of the sixteenth annual convention of the Northwest Electric Light and Power Association, held at the Hotel Washington, Seattle, June 27-30, 1923. Over 250 members and guests registered for the sessions, which were pronounced to be the most successful in the history of the organization.

The convention opened, Wednesday, June 27, with an address of welcome by A. W. Leonard, president of the Puget Sound Power & Light Company. A response was made by John A. Laing, vice-president and general attorney of the Pacific Power & Light Company. In the president's address, Norwood W. Brockett, of the Puget Sound Power & Light Company, stated that the program for the 1923 convention was unusual in that a number of men from outside of the electrical industry had been invited to come before the members and frankly discuss the problems of the industry, as viewed by those disassociated with its activities. He emphasized the efforts which had been made during the year to get more members interested in the work of the association. One of the most important accomplishments of the past year, he declared, was the arrangements made toward a scholarship in any of the higher institutions of Washington to the high school student writing the best essay on state regulation of utilities. This step, he believed, would tend to promote a closer study of public utilties by the rising generation, giving them a clearer understanding of some of the problems of the day.

Leaders Speak

The afternoon session was devoted to a general program in which business leaders from outside the industry gave their views regarding utility problems. J. D. Barnhill, president of Evans & Barnhill, Inc., San Francisco, spoke on "Public Utility Publicity and Advertising." Mr. Barnhill declared that the problem of the utilities today was no longer an economic one but a social one. Power company engineers, he said, have succeeded in solving the problems of rendering service in an efficient and economical manner, and now it remains for the central stations to make the public conscious of this fact. He stated that the criticism which is directed against the utilities is largely due to a lack of information. It was his opinion that advertising has pleaded similar cases before the court of popular opinion and has won the decision. He believed that the forces which clamor against the utility can be converted into positive and friendly forces by the simple expedient of popular education through frank and constructive advertising.

Dangers of Socialism

H. S. Ives, secretary of the Casualty Information Clearing House of Chicago, delivered the feature address of the day, giving the members of the association an entirely new angle on their problems. He stressed the necessity for a realization on the part of utilities and every privately owned enterprise that they have a common problem in combatting the public ownership sentiment which is sweeping over the nation and which threatens to engulf the country in a reign of Socialism. His topic, "State and Municipal Ownership from the Insurance Man's Point of View," demonstrated that the interdependence of private enterprise in fighting municipal and state ownership is not a myth. He appealed for a closer understanding between those industries which are threatened by this sentiment.

"Merchandising" was the title of a paper given by George C. Pratt, president of the Washington State Retailers' Association. Mr. Pratt showed where those engaged in merchandising electrical appliances were not taking full advantage of their window displays to sell goods. He declared that the progressive and successful merchant changes his window trim twice a week, while the electrical retailer usually fails to make a new trim as often as once a week. If the industry expects to sell household electrical appliances, he declared, steps must be taken to make it convenient for the purchaser to use them by standardizing the plugs and receptacles at both ends of the cord. He emphasized the necessity of proper contact with women customers, as they are the largest purchasers of electrical appliances.

E. V. Kuykendall, director of the Board of Public Works of the State of Washington, addressed an evening meeting on "Public Opinion on Commission Regulations." He stated that utilities generally favor commission regulation, but the existence of these bodies is threatened by popular disfavor. Courtesy in a utility's dealings with the public, he declared, is more important than sheer efficiency and low rates combined.

Two other speakers addressed the evening meeting. W. H. McGrath, vice-president of the Puget Sound Power & Light Company, spoke on "Public Ownership of Utility Securities," outlining the strides which have been made in this important phase of development during the past few years. Carl D. Jackson, general counsel, National Electric Light Association, New York, discussed some of the important commission and court decisions in his address on "Trend of Court Decisions and Legislation."

In his talk, Mr. McGrath spoke of the good will which can be attained through the widespread distribution of utility securities among consumers and the public in general. He said:

"The reason for the misconception of public utilities on the part of the people is the radical press, which fosters hostility to these companies. When we have tens of thousands of local stockholders in our local utilities, the radicals will not dare to make glaring misstatements of facts. In California, last November, for instance, the people defeated a socialistic scheme for state ownership of the power

business by 5 to 2. We must not be misled in this great Northwest by the Utopian schemes of an organized fanatical minority, if the basic principles of the constitution and the rights of human liberty and initiative are to be preserved."

Section Meetings

Parallel meetings of the Commercial, Technical, Public Relations and Accounting sections were held throughout the day, Thursday, June 27. The work of these various sections has been carried out during the year by numerous sub-committees functioning under the direction of an executive committee.

The most important of the section meetings was that given over to public relations, presided over by George L. Myers of the Pacific Power & Light Company. The following papers were read and discussed at these meetings: "Relations With Educational Institutions," by O. B. Coldwell, vice-president, Portland Railway, Light & Power Company; "Employees Relations With the Public," by A. C. McMicken, sales manager, Portland Railway, Power & Light Company; "Publicity," by J. V. Strange, assistant manager, Pacific Power & Light Company; "Illustrated Lectures and Motion Picture Exhibits," by Lewis A. McArthur, general manager, Pacific Power & Light Company; "Organization of Committees on Public Utility Information," by George L. Myers, assistant to the president, Pacific Power & Light Company; "Public Ownership of Securities," by S. E. Skelley, manager, investment department, Pacific Power & Light Company; "Public Speaking," by W. R. Putnam, vice-president and general manager, Idaho Power Company.

All of these papers brought forth considerable discussion and it was the consensus of opinion at the close of the meetings that the work of the committees during the past year has been highly successful.

The meetings of the Commercial Section were given over to reports from the lighting, power and merchandise sales bureaus, together with papers on "Commercial Service and Relations with Customers" and "Electric Vehicles." Lewis A. Lewis, commercial manager of the Washington Water Power Company, presided at these sessions.

Both the Technical and Accounting section meetings brought forth much interesting discussion. George F. Nevins, secretary and treasurer of the Pacific Power & Light Company, presided over the meetings of the Accounting Section, while R. M. Boykin, manager, North Coast Power Company, as chairman of the Technical Section, led the discussion at the meetings of that body.

Delegates and guests at the sixteenth annual convention of the Northwest Electric Light and Power Association, Hotel Washington, Seattle, June 27-30, 1923.

On Friday, practically everyone who registered at the convention went by boat to Victoria, B. C., where the golf tournament, annual banquet and final executive session were held.

New Officers

The election of officers, held at the final executive session, placed the following men at the helm of the organization for the coming year.

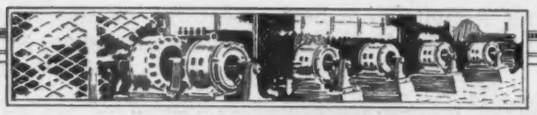
President: George L. Myers, assistant to the president, Pacific Power & Light Company, Portland.

Vice-presidents: R. M. Boykin, manager, North Coast Power Company, Portland; R. B. King, general superintendent, Idaho Power Company, Boise; S. R. Inch, vice-president and general manager, Utah Power & Light Company, Salt Lake City; A. C. McMicken, sales manager, Portland Railway, Light & Power Company, Portland.

Executive Committee: Lewis A. Lewis, commercial manager, Washington Water Power Company, Spokane; L. B. Faulkner, president, Olympia Light & Power Company, Olympia, Wash.; L. A. McArthur, vice-president and general manager, Pacific Power & Light Company, Portland.

The Kilowatt Cup tournament, held on the Colwood links, at Victoria, was won by Bon E. Stein of Seattle, who had both low net and low gross score. A. C. McMicken of Portland was second, while A. W. Leonard of Seattle was third. Entertainment features during the convention consisted of drives, visits to points of interest and special luncheons.

ELECTRICAL CONSTRUCTION



By E. Earl Browne

DUE to the extended use of electric ranges and air heaters in apartments and realizing that services "over-coppered" often run the cost of these installations into a large sum per kilowatt of connected load, the power companies, contractors and inspection departments are attempting to co-operate in arriving at a reasonable set of requirements covering the installation of services, feeders and sub-feeders.

The subject of diversity factors, to be allowed in connection with these installations, is one that at the present time is more or less a "cut-and-try" proposition, but as it was necessary to make a beginning somewhere the Department of Electricity of San Francisco recently issued an order covering installations of three or more ranges, allowing the following diversity factors in calculating the size of services:

3 to 6 Ranges—Largest range, full load; balance 66⅔%
7 to 10 Ranges—Largest range, full load; balance 50%
Over 10 Ranges—50% full load

In regard to air heaters, however, a different problem presents itself as it is realized that there is a possibility of occasions arising where all heaters will be in operation, particularly in a building containing apartments consisting of a living room, bath and kitchen. The living room is often the only room with a heater in it; therefore, each apartment has but the one heater and in cold weather the diversity would be largely dependent on the number of tenants absent from their apartments. In cases such as this a factor of 85 or 90 per cent in calculating the size of service conductors would probably be reasonable, although the City of San Francisco Department of Electricity has established a rule allowing service feeds and sub-feeds to be calculated on the basis of 100 per cent for the largest heater and 50 per cent for the remainder.

In case of buildings with apartments, each containing a living room, bed room, kitchen and bath, with a heater of the following sizes in each, a factor of 60 per cent would probably be ample in calculating the size of service:

Living room	3⅓kw.
Bedroom	2½kw.
Bath	1⅔kw.
Kitchen	1⅔kw.
	9⅙kw.

The sub-feeders to the apartments would in the case of the apartment with a range and one air heater have to be wired for 100 per cent diversity factor. Where the apartments have a range and four air heaters, as assumed above, the range would be wired for 100 per cent diversity factor and the air heaters for not less than 70 per cent. Other common sizes of apartments with various combinations of range and air heaters would be calculated as follows:

Two-Room Apartments (Example No. 1).

1 range	6 kw.	x 100% D.F.	=6.00 kw.
1 air heater in living room,	3⅓ kw.	x 100% D.F.	=3.33 kw.
		Total	8.33 kw.

8.33 kw. ÷ 230 volts = 36 amp.

Two-Room Apartments (Example No. 2).

1 range	6 kw.	x 100% D.F.	=6.00 kw.
1 air heater in living room,	3⅓ kw.	x 100% D.F.	=3.33 kw.
1 air heater in bath room	1⅔ kw.	x 100% D.F.	=1.67 kw.
		Total	10.00 kw.

10.00 kw. ÷ 230 volts = 43.5 amp.

Two-Room Apartments (Example No. 3).

1 range	6 kw.	x 100% D.F.	=6.00 kw.
1 air heater in living room,	3⅓ kw.	x 75% D.F.	=2.50 kw.
1 air heater in bath room	1⅔ kw.	x 75% D.F.	=1.25 kw.
1 air heater in kitchen	1⅔ kw.	x 75% D.F.	=1.25 kw.
		Total	10.00 kw.

10.00 kw. ÷ 230 volts = 43.5 amp.

Three-Room Apartments (Example No. 4).

1 range	7 kw.	x 100% D.F.	=7.00 kw.
1 air heater in living room,	3⅓ kw.	x 100% D.F.	=3.33 kw.
1 air heater in bed room	2½ kw.	x 100% D.F.	=2.50 kw.
		Total	12.83 kw.

12.83 kw. ÷ 230 volts = 56 amp.

Three-Room Apartments (Example No. 5).

1 range	7 kw.	x 100% D.F.	=7.00 kw.
1 air heater in living room,	3⅓ kw.	x 80% D.F.	=2.67 kw.
1 air heater in bed room	2½ kw.	x 80% D.F.	=2.00 kw.
1 air heater in bath room	1⅔ kw.	x 80% D.F.	=1.33 kw.
		Total	13.00 kw.

13.00 kw. ÷ 230 volts = 56.5 amp.

Three-Room Apartments (Example No. 6).

1 range	7 kw.	x 100% D.F.	=7.00 kw.
1 air heater in living room,	3⅓ kw.	x 70% D.F.	=2.33 kw.
1 air heater in bed room	2½ kw.	x 70% D.F.	=1.75 kw.
1 air heater in bath room	1⅔ kw.	x 70% D.F.	=1.17 kw.
1 air heater in kitchen	1⅔ kw.	x 70% D.F.	=1.17 kw.
		Total	13.42 kw.

13.42 kw. ÷ 230 volts = 58 amp.

Four-Room Apartments (Example No. 7).

1 range	7 kw.	x 100% D.F.	=7.00 kw.
1 air heater in living room,	3⅓ kw.	x 70% D.F.	=2.33 kw.
1 air heater in bed room	2½ kw.	x 70% D.F.	=1.75 kw.
1 air heater in bed room	2½ kw.	x 70% D.F.	=1.75 kw.
		Total	12.83 kw.

12.83 kw. ÷ 230 volts = 56 amp.

Four-Room Apartments (Example No. 8).

1 range	7 kw.	x 100%	D.F.	7.00 kw.
1 air heater in living room,	3½ kw.	x 70%	D.F.	2.33 kw.
1 air heater in bed room	2½ kw.	x 70%	D.F.	1.75 kw.
1 air heater in bed room	2½ kw.	x 70%	D.F.	1.75 kw.
1 air heater in bath room	1⅔ kw.	x 70%	D.F.	1.17 kw.
			Total	14.00 kw.

14.00 kw. ÷ 230 volts = 61 amp.

Four-Room Apartments (Example No. 9).

1 range	7 kw.	x 100 %	D.F.	7.00 kw.
1 air heater in living room,	3⅓ kw.	x 66⅔%	D.F.	2.22 kw.
1 air heater in bed room	2½ kw.	x 66⅔%	D.F.	1.67 kw.
1 air heater in bed room	2½ kw.	x 66⅔%	D.F.	1.67 kw.
1 air heater in bath room	1⅔ kw.	x 66⅔%	D.F.	1.11 kw.
1 air heater in kitchen	1⅔ kw.	x 66⅔%	D.F.	1.11 kw.
			Total	14.78 kw.

14.78 kw. ÷ 230 volts = 64 amp.

Assuming, then, a 12-apartment building, as per Example No. 1, the service for same would be figured as follows:

12 ranges of	5 kw.	each = 60 kw. x 50%	D.F.	30 kw.
12 air heaters of	3⅓ kw.	each = 40 kw. x 85%	D.F.	34 kw.
			Total	64 kw.

Total	64 kw. ÷ 230 volts = 278 amp.	on two conductors
Ranges	30 kw. ÷ 230 volts = 120 amp.	on neutral

Therefore, two 300,000 C.M. and one No. O B&S.R.C. cables in 2½-in. conduit and a 400-amp. service switch would be required.

A six-apartment building, as per Example No. 5, would have the service calculated as follows:

1 range of	7 kw.	each = 7 kw. x 100 %	D.F.	7.00 kw.
5 ranges of	7 kw.	each = 35 kw. x 66⅔%	D.F.	23.33 kw.
6 air heaters,	3⅓ kw.	each = 20 kw. x 60 %	D.F.	12.00 kw.
6 air heaters,	2½ kw.	each = 15 kw. x 60 %	D.F.	9.00 kw.
6 air heaters,	1⅔ kw.	each = 10 kw. x 60 %	D.F.	6.00 kw.
			Total	57.33 kw.

Total	57.33 kw. ÷ 230 volts = 250 amp.	on two conductors
Ranges	30.33 kw. ÷ 230 volts = 132 amp.	on neutral

Therefore, two 250,000 C.M. and one No. O B&S.R.C. cables in 2½-in. conduit and a 400-amp. switch would be required.

The service for a 24-apartment building, as per Example No. 9, would be figured as follows:

24 ranges of	7 kw.	each = 168 kw. x 50%	D.F.	84 kw.
24 air heaters of	3⅓ kw.	each = 80 kw. x 60%	D.F.	48 kw.
48 air heaters of	2½ kw.	each = 124 kw. x 60%	D.F.	74 kw.
48 air heaters of	1⅔ kw.	each = 80 kw. x 60%	D.F.	48 kw.
			Total	254 kw.

Total	254 kw. ÷ 230 volts = 1,104 amp.	on two conductors
Ranges	84 kw. ÷ 230 volts = 365 amp.	on neutral

Therefore, two 2,000,000 C.M. and one 500,000 C.M.R.C. cables in 6-in. conduit and a 1,200-amp. service switch would be required. Due to the fact that 2,000,000 C.M. cable is difficult to handle, it is preferable to use two 750,000 C.M. cables for each of the two outside conductors, which would make a total of four 750,000 and one 500,000 C.M.R.C. cables in a 5-in. conduit; or two 750,000 C.M. and one No. 3/O in each of two 3½-in. conduits would solve the problem, as it is often difficult to procure larger than 4-in. conduit in regular stock.

If considerable air heating at 230 volts is to be connected, it is preferable to the power company to use 3-phase with a neutral from the middle tap of one transformer in a delta connected bank, to give the 220/110 volts, 3-wire, single-phase for lighting, ranges, convenience outlets, etc. This arrangement also saves the owner a considerable sum in investment for service, feeder and sub-feeders, as the current per wire for the 3-phase load is but 58 per cent of the current in the outside conductors of a single-phase system.

Using the last service example as an illustration:

The heating load	= 170 kw.	= 427 amp. on 3-phase
The range load	= 84 kw.	= 365 amp. on 1-phase

which would impose a load of 792 amp. on each of two conductors, 442 amp. on each of one conductor, 365 amp. on neutral conductor. This would then require a 4½-in. conduit, containing four 500,000 C.M. cables, one 600,000 C.M. cable for 3-phase conductors and one 500,000 C.M. cable for neutral and an 800-amp., four-pole service switch, if all current is to be disconnected by one switch, or one 600-amp., three-pole for the 3-phase heating, if it is metered separately from the ranges, and a 400-amp., three-pole for the 220/110-volt single-phase ranges.

Instructions for Telephone Wiring

Referring to the last article, the following additional information relative to installing telephone systems in apartment houses is recommended by the telephone company:

The recesses necessary to accommodate the vestibule sets of apartment house systems are as follows: 12-line system, inside measurements, 10⅞ in. high, 5½ in. wide, 2 in. deep; 24-line system, inside measurements, 14⅝ in. high, 5 27/32 in. wide, 2 in. deep; 36-line station, inside measurements, 18 in. high, 6 1/16 in. wide, 2 in. deep; No. 377C 36-line station, inside measurements, 19¼ in. high, 7⅝ in. wide, 4 in. deep.

Size of apartment set, including coin collector, 7⅛ in. wide x 23¾ in. high x 3 in. deep. Minimum size of recess for same, 16 in. wide x 26 in. high x 3 in. deep.

Dimensions of the ordinary wall telephone set with coin collector: width over receiver 9½ in., height of blackboard 21 in., depth from mouthpiece to rear surface 7 in. Terminate at a common point, leaving 9 ft. of slack in buildings where 20 or more pairs are necessary and 6 ft. where there are less than 20 pairs.

The following schedule relative to the size of conduit must be adhered to:

One pair	½-in. conduit
Two and three pair	¾-in. conduit
Four and five pair	1-in. conduit
Six and seven pair	1¼-in. conduit
Eight to thirteen pair	1½-in. conduit

In large apartments where an office is kept open it is desirable to have a P.B.X. (private branch exchange) system, as with this system if a tenant is out an important call or message may be left for prompt delivery on his return.

JOBBER, DEALER AND SALES AGENT

Second Electric Home Is Displayed at Sacramento

Electrical Men Capitalize on "Better Homes Exposition" Idea and Present Display to Nine Thousand People

The first half of the California Electrical Campaign's electric home program for 1923, closed with the showing of a bungalow in Sacramento, June 1-10. A total of 8,500 people visited the home, which is considered a fairly good showing, as this was the second home to be displayed in the city.

The industry was able to capitalize on the "Better Homes Exposition" idea, for the bungalow was on display during Better Homes Week, along with several other model residences.

The feature of the display was the cooperation secured from the local newspapers as a result of the exposition. In a special 14-page Better Homes section of the Sacramento Bee, the industry placed 328 in. of display advertising and secured many columns of favorable publicity.

The question of the methods which should be employed in advertising the electric home was solved in a novel manner. One large advertisement was used by the California State Association of Contractors and Dealers, containing the names of all members in the city.

The following poem, submitted by a member of the electrical industry as descriptive of the home, is used in place of a more prosaic description:

The electrical home is lighted
In every conceivable way,
That's modern and bright and attractive
And it's out near "Donner Way."

People are thronging in hundreds
To see this home of light,
Many will call and then come again
Just for a second sight.

Housewives and brides and maidens,
Husbands—or those to be—
Pass steadily through the portal
To learn electrically.

"Carly" they call the builder,
The furnishers, "Frazier & Dunn,"
The praises of the multitude
Their sterling work has won.

There's beauty and music in it,
Which comes from Sherman & Clay,
The lighting comes from Hobrecht
He does it well, I'll say.

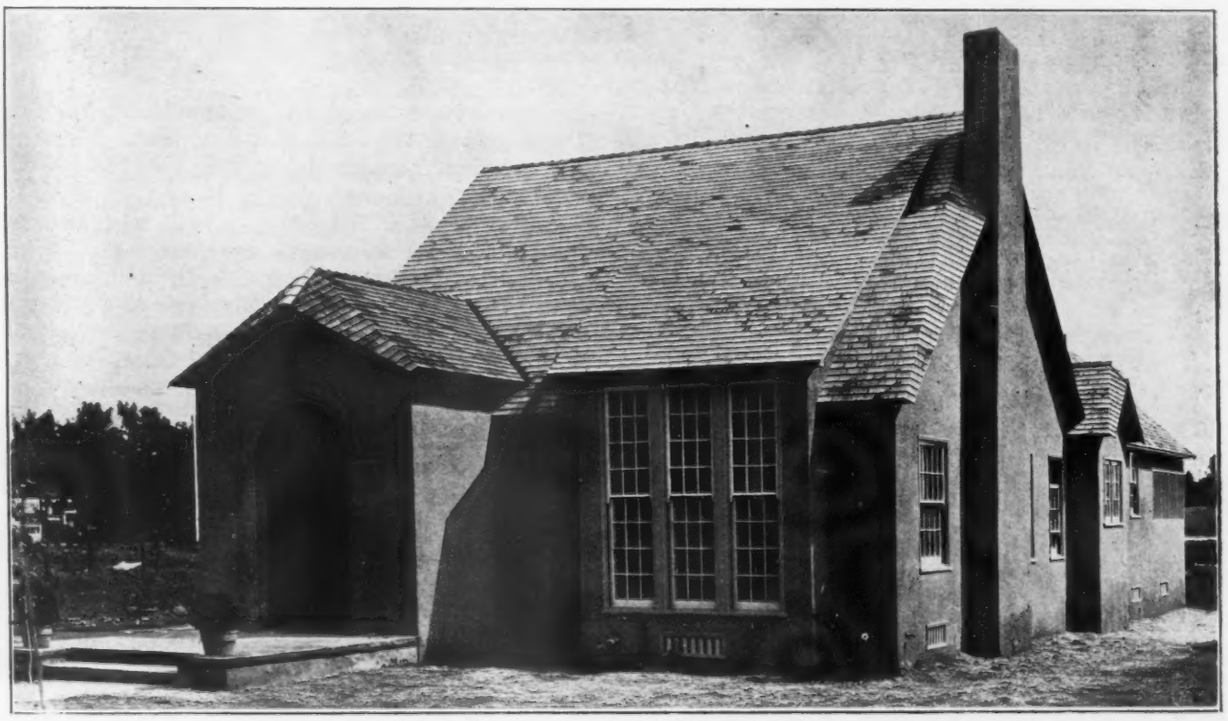
The "Pacific Gas and Electric"
Deserves some credit, too,
As well as the "Great Western Power"
And the contractor-dealer crew.

Just see the modern kitchen
With everything at hand
Clean and cool and convenient,
Electrically planned.

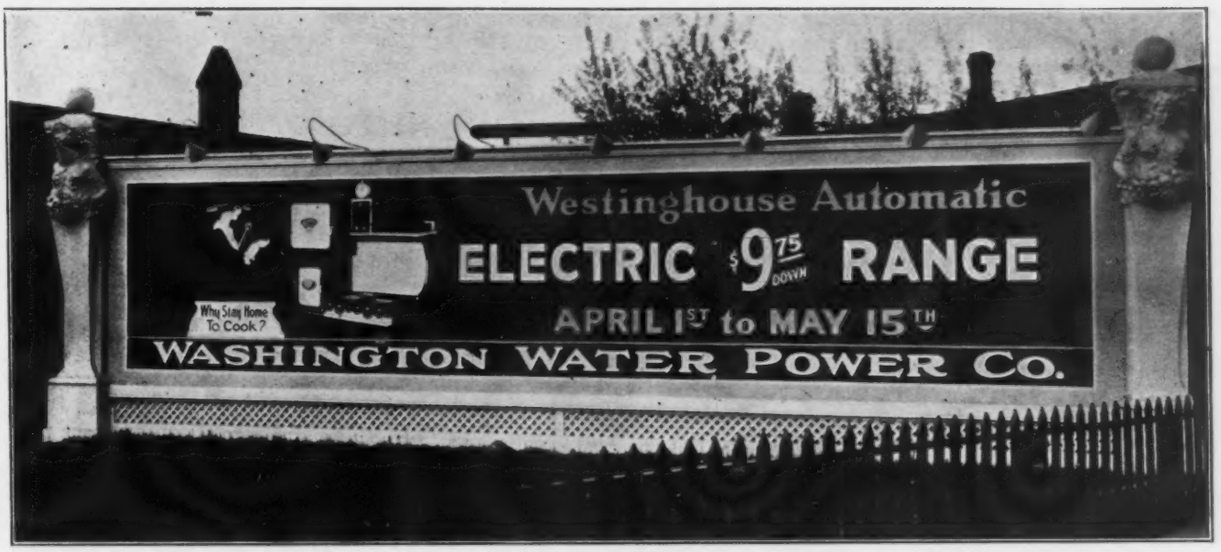
You'll find the hostess charming
And graciously inclined
To answer all your questions
Or what you have in mind.

Don't miss the "Hathaway" Cottage
Nor the one at 29th and T,
Nor yet the one at 910-9th,
This is "Better Homes" week, you see.

And when the week is ended,
As ended as this "pome,"
You will remember longest
The "Beautiful, Convenient, Artistic,
Modern, Indispensable, Charming—
The Bright Electric Home."



The house shown above was displayed by the electrical men of Sacramento to 8,500 people during "Better Homes Exposition" held there recently.



Bill boards of this character told the people of Spokane of the special range offer that was made by the Washington Water Power Company.

Doing the Sales Work of One Year in Six Weeks

Spokane Central Station Sells One-Tenth as Many Ranges During Campaign as It Had Sold in the Past Ten Years.

When the Washington Water Power Company of Spokane, Wash., decided to start on an electric range selling campaign, Lewis A. Lewis, sales manager of the company, hoped that between 150 and 200 ranges would be placed in the six weeks that the campaign was to run. Mr. Lewis considered the condition of the territory served by the company and found that in the last ten years 4,030 electric ranges had been put in service in Spokane and the "Inland Empire."

With the goal set as 200 ranges, for the period from April 1 to May 15, the commercial department of the Washington Water Power Company, in Spokane, and the district agents in the various cities served by the company, set to work. On May 14, at a banquet given by the Washington Electric Supply Company, distributor for the Westinghouse Electric & Manufacturing Company, it was announced that 300 ranges had been sold up to that time. Those in charge of the sales reported that full accounts had not been received, and on the day after the campaign had closed, full reports showed that 431 ranges had been sold in the six weeks.

In every case where a range was sold an electric water heater was also purchased by the customer. The total rating of the equipment was 7 kw. The success of the campaign can only be fully realized when it is known that from the equipment installed the Washington Water Power Company expects to receive $39,000 additional revenue per year. The average price of the ranges and water heaters installed was $249.75, and the total gross sales value of the equipment was $107,000. To cut down the line extension costs, salesmen made it a point to notice the location of transformers and concentrated their efforts in the vicinity of these transformers. This also permitted the company to provide service with less delay.

The territory served by the Washington Water Power Company has a population of 170,000 persons. In the city of Spokane there are 24,700 residential customers, and in the towns directly served, 7,500 residences receive power from this company. At the close of the sales campaign statistics showed that there were 2,583 electric ranges in service in Spokane, while 1,878 were installed in the towns directly served by the power company. These figures show that in the entire territory 13.9 per cent of the residential customers are using electric ranges. The ratio of range users to residential customers is higher in the outlying towns than it is in Spokane, the percentages being 10.5 for Spokane and 25 for the "Inland Empire" towns directly served.

The recent sales campaign showed that the six city salesmen and the four Electric Shop salesmen of the Washington Water Power Company sold 232 ranges in Spokane, while the twenty-five district agents in the towns of the "Inland Empire" placed 199 ranges and water heaters. Three hundred and ninety-three of the 431 ranges sold were Westinghouse Electric & Manufacturing Company products, types 2-19B and 3-19B. Thirty-eight ranges of other standard makes were also installed during the campaign.

The principal features of the campaign were the advertising copy and the low initial payment plan used. Two different ideas were used in preparing the advertising campaign. In Spokane, the only preliminary advertising was a blind advertisement which appeared in the local papers one week prior to the campaign. The figures "$9.75" were enclosed in a circle and were surrounded by white space in a 10-in. advertisement. The day after the sale was opened inserts were enclosed in all residential bills sent out by the power company. Illuminated sign boards were also used to carry the message of the campaign to the people of Spokane.

RULES GOVERNING WESTINGHOUSE PRIZE BREAD BAKING CONTEST

1. Each purchaser of a Westinghouse Electric Range between April 1st and May 15th, (inc.) 1923, will be eligible to enter contest.
2. One loaf of bread which has been baked in the range you purchased to be the entry.
3. Before 2:00 P. M. on June 9th, 1923, your entry must be delivered to the Electric Kitchen in the general offices of The Washington Water Power Company.
4. Presentation of this card will entitle you to make your entry.
5. To the purchaser who enters the best loaf of bread based upon texture, color, flavor and shape, will be given a receipt marked "PAID IN FULL" for the Westinghouse Electric Range and Water Heater installed that you purchased during the period from April 1st to May 15th, inc., 1923.
6. The following authorities on bread have agreed to serve as judges:

   Carl Siegle—Model Bakery
   W. E. Rockhill, Supt.—Spokane Bakery Co.
   T. R. James, Chemist—Sperry Flour Co.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY.

A reproduction of the reverse side of the card entitling persons, who purchased a Westinghouse range during the campaign, to participate in the bread-baking contest. As the card states, the winner was given the range and hot water heater free. Purchaser's name was on the card face.

SALE OPENS April 1 - Closes May 15

Westinghouse Automatic Electric Range—With Water Heater

THE Westinghouse Electric and Manufacturing Co. now present to all our customers using electric service a spectacular super-sale of Westinghouse Automatic Electric Ranges. This sale offers the following advantages—

1—Range and water heater installed at a reduced price.

2—Lowest down payment we have ever offered.

3—Free with each range, an aluminum four-piece Cloverleaf cooking set.

4—An opportunity to enter bread baking contest at close of sale. First prize to be a receipt marked "Paid in Full" for the range you purchased. In other words an opportunity to get your range absolutely free.

Phone, Call or Write—

THE WASHINGTON WATER POWER COMPANY

"Cook by Wire—Instead of Fire"

This insert was mailed out with all residential power bills after April 2. The dates were printed in red, thus drawing attention to the fact that purchasers should act immediately to secure benefits.

These were located at conspicuous places on the most traveled car lines. After April 1, newspaper advertising was run in the three local papers. In 31 advertisements, 2,011 in. of space was used.

No preliminary advertising was done by the company in the towns of the "Inland Empire." A campaign, consisting of window cards, slides for moving picture shows and advertising in local papers was started in these towns on April 1. During the six weeks' period a Westinghouse range demonstrator visited the fifteen principal district offices, otherwise no intensive work was done in these towns. From figures secured after the campaign, it was determined that the net cost of advertising for these country towns was not over $3 per range sold there. From the most conservative standpoint, it can be stated that in proportion to the magnitude of the results, the advertising was remarkably small in volume and low in expense.

The payment plan adopted by the Washington Water Power Company called for an initial outlay of $9.75, hence the blind advertisement carrying these figures. Monthly payments were set at $10 as a minimum. This easy payment plan was undoubtedly in a large way responsible for the success of the campaign. Other special inducements included the 4-piece "cloverleaf" cooking set that was given free with each range purchased and the opportunity to enter the bread baking contest. The winner of this contest was given her range and water heater free. The contest was held a month after the campaign closed in order that entrants might have an opportunity to become accustomed to their ranges before the contest opened. The contest was open only to those persons who purchased a Westinghouse range and water heater during the sale period. The winner was not even required to pay installation charges on the equipment.

In speaking of the results of the campaign, at the banquet given by the Washington Electric Supply Company, Mr. Lewis said that the success was due not only to the high caliber of the salesmen, but also to the cooperation of the other departments of his company, particularly the service, line and accounting departments. Mr. Lewis claimed that if it had not been for the combined work of all of the departments of the company the campaign could not have been the success it was.

The results achieved by the Washington Water Power Company are truly remarkable. In six weeks the company placed one-tenth as many ranges as had been placed in the past ten years. The costs to the company were not exorbitant and the results in increased load will cover up the sales costs in a short time.

CATERING TO THE KATIES

By Joe Osier.

What are you, as an up-to-date Contractor-Dealer, doing to interest the frails, the Fannies and the Florences in your proposition?

Which proposition includes selling and installing the latest in flossy fixtures.

Are you putting out pelf in advertising copy that will interest them? Are you maintaining a window display that will make 'em stop, look and let go? Are you making a play for their favor

And their lunch card's loose kale, or are you just hanging tuff, waiting and

Wondering why you, too, cannot garner a little grease?

If you are engaged in doing the latter, Brother, take my word for it, you might as well hang up the "For Rent" sign and go fishing, because—

It is a fact that the fish—in the water—show no partiality when it comes to throwing a mean lip over the morning meal.

Unlike fastidious purchasers of electrical merchandise, a hungry fish does not have to have the idea sold to him. He, I'm of the opinion, takes his fly where he finds it, and—

Recks not of the morrow—but—

Men's sparring partners, as a rule, want what they want, and—

Usually get it—providing the checks in Papa's bank book hold out, and—

Seeing that most any Elmer is willing for his Ella to drive the family chariot—buy most of the meals at the delicatessen, and—

Build the fires—

He is also not adverse to permitting her to select the fixtures and the fumadiddles which make up—

A happy, snappy home.

Therefore, friends, conceding that I have talked with a straight tongue, why would it not be the proper caper to unleash a few ideas—put them into practice, and see if you cannot snag some of this Wednesday and Saturday afternoon shopping business which is swirling by the main entrance.

Officially, it is reported, women love to shop, and—it is also rumored that—

Patience and a mulberry leaf will make a silk gown—therefore, admitting, for the sake of argument, that this report and rumor can be verified—

Why not add two and two together, and crochet some over-the-counter business?

If women love to shop, foster that love and make your store the trysting place for all the lovely shoppers who have—

A yearning for things electrical. Go ahead! Make your advances—press your suit with an electric iron, and lead them to—

The jolly old cash register.

You know, I am in hearty accord with the Bird who authored these lines:

"Thatch your roof before rainy weather; dig your well before you become parched with thirst." He knew what he was talking about and I'll wager he—

Salted away many seeds before he was called in, and—

Right now, I can see no particular reason why every man in the business of selling and installing electrical

Appliances, appurtenances and apparatus—

Cannot take the tip. Those who do will win, and, by the same token, those who don't—

Will walk, and, most likely, tote a sack of tools in the bargain.

Announce Winners in June Bride Window Display Contest

Reports indicate that the second annual June Bride Week sponsored by the California Electrical Cooperative Campaign as a means of stimulating the sale of appliances, achieved excellent results in all parts of California. While the number of dealers to take advantage of the free window display and advertising material prepared by the Campaign was proportionately small, the benefits derived by those who did so were well worth while.

Excellent results are reported from southern California where the Southern California Edison Company staged an advertising campaign to tie in with the June Bride idea in all parts of the territory this central station serves.

The prize winners in the window display contest conducted by the Campaign are as follows:

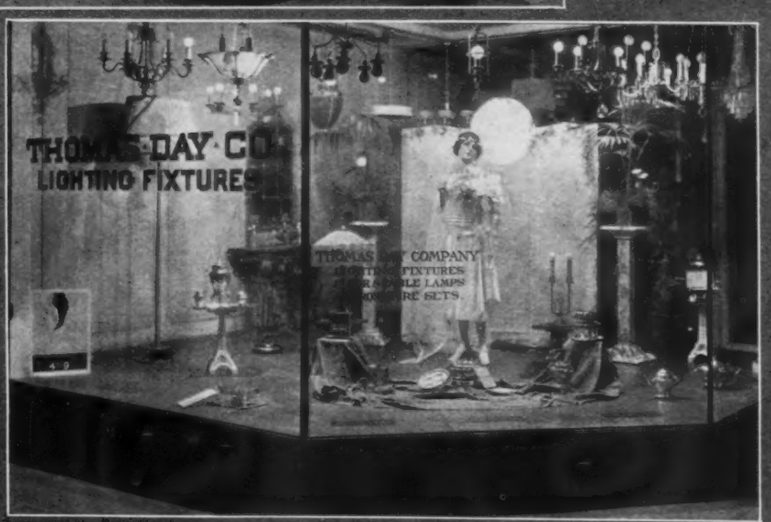
First: Thomas Day Company, Oakland. Window decorated by Mrs. Kathryn M. Tefft.

Second: Levy Electric Company, San Francisco. Window decorated by F. Ingel, Jr.

Third: Kenyon Electric Company, Oakland. Window decorated by R. E. Kenyon.

Pictures of the prize winning windows are reproduced on the following page.

AT the top is the window of the Levy Electric Company, San Francisco, which won second prize in the June Bride Week Contest. At the left is the window of the Kenyon Electric Company, Oakland, third prize winner, while at the bottom is the display of the Thomas Day Company, Oakland, which won first prize.



The Service Station Is a Factor in Merchandising

Show Room of Edison Electric Appliance Company at Salt Lake City Is Practical Aid to Jobbers and Dealers

Manufacturers have recognized that their success is based largely on the service that they render, but the organization of service stations has been a comparatively recent development. The furnishing of sales promotion material and the placing of national advertising have always been considered as part of the manufacturer's service, but it has not been until recently that repair stations have been established, in the larger centers, to supplement the other activities. The general rule has been that where service stations were maintained, they were located in some loft building in a remote section of the city. Thus, these stations rendered a valuable service, in that they saved considerable time for the dealer with appliances needing repair, but they added little or nothing toward a solution of the larger problem of local merchandising.

One of the most up-to-date and completely equipped of the new class of service stations is that of the Edison Electric Appliance Company, located at Salt Lake City, Utah. Through the efforts of B. E. Rowley, district sales manager of the Rocky Mountain territory, the new type of service station was located in Salt Lake City. Mr. Rowley, seeing the station in a different light, induced his company to establish quarters in a ground-floor location on one of the main streets of the city. In that location a modern electrical store was opened from which no retail selling is done, but one that is in all other particulars a most attractive local dealer's store.

The station is located at 60 East First South Street and is under the supervision of John Montgomery. The office is located in the rear of the mezzanine floor and store room for equipment and repair parts occupies the basement of the building. A display window in the front of the store adds appreciably to the value of the location.

Through this service station the manufacturer is able to render a real help to the dealer by showing him what an attractive and well laid out store can do. This activity permits the manufacturer to supplement the impersonal newspaper and magazine advertising campaigns with the more direct appeal of good window displays and well arranged stock exhibits. The local dealer is also given another show room to take prospective customers through, as the service station display is at the disposal of any dealer in the manufacturer's line.

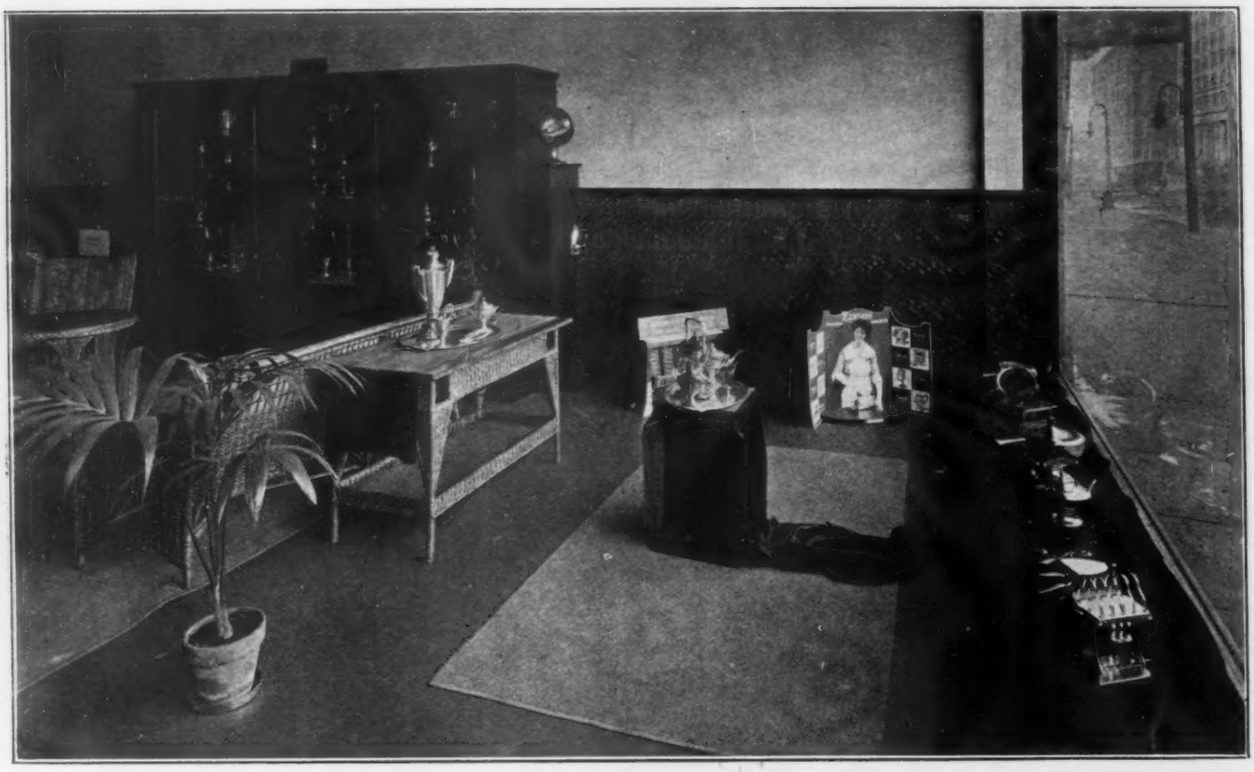
Because ideas of good sales methods have been brought forth in the service station, the standards of store arrangement and window displays have been raised considerably in the territory served by the station. The ideas put forward by the manufacturer's establishment have usually been put into actual use at the Salt Lake City station, and in this way practical tests have been made of their value before the dealers try them out for themselves.

One of these suggestions covers the use of a portable stage setting which can be used to wall off the window space for a special room display, when that is desired. These walls can be repapered without great expense, and thus form an effective background for kitchen, parlor or bathroom, as they are needed. Since the walls are portable it is possible to remove them entirely from the display window when full light is desired in the interior of the store. An entirely new aspect is presented when the background is removed. The frames are light enough to permit them to be transported from place to place with little trouble and this enables the manufacturer to use them at county fairs or electrical shows as backgrounds for displays.

Linoleum has been used as the floor covering for this display. It has been found that the linoleum is both attractive and economical and is easily kept clean. A design has been chosen which is suitable for a kitchen floor and which with the addition of rugs is appropriate as floor covering for a sitting room display. The rugs used can be readily transported with the rest of the equipment.

In arranging the interior of the store, considerable attention was paid to making it a place which would be suitable for dealers to use as a supplementary sales room. An attractive sitting room with wicker furniture and a soft rug under foot is located to the rear of the show window. A writing desk is provided for customers who have any business to conduct in the store. Smaller appliances are grouped in a well lighted counter case, which, together with a wall case of special design, partially closes this "customer's room" off from the rest of the store.

Store managers have found that in the ordinary wall case it has been difficult to make the prospect's eye focus on any one object displayed there. Ob-



Interior view of the service station of the Edison Electric Appliance Company at Salt Lake City, Utah. Note how each appliance displayed in the wall case stands out from the others, because of the staggered arrangement of the shelves. The chairs and table at the left are for customers.

Exterior of the store occupied by the Edison Electric Appliance Company service station at Salt Lake City, Utah. When it is desirable to have the interior of the store visible from the street the portable background of the display may be removed. Daylight is admitted to the store this way.

jects placed on long rows of shelves present a confused mass to the eye, as it is a psychological fact that the eye tends to follow lines. The result is that the attention wanders from one object to another, with no particular place to rest. Mr. Rowley recognized this fact and had the wall case for the service station built with staggered shelves, so that each appliance is on a separate level. Each appliance is thus set off from the others in the case, instead of being one in a long row of devices. The customer's eye is attracted to a coffee pot or chafing dish and the attention focuses on the single object.

Larger equipment is displayed in the rear of the store. There samples of each of the electric ranges, ovens, etc., that are manufactured by the company, are placed along the wall. To assist dealers who use the salesroom, labels stating the size and purpose of each device are attached to each piece of equipment. The dealer can thus give the customers full information without calling on the manufacturer's salesman for this. In addition, the visitor can find out himself just what each device is intended for, thus gaining an idea of the variety of equipment manufactured by the company.

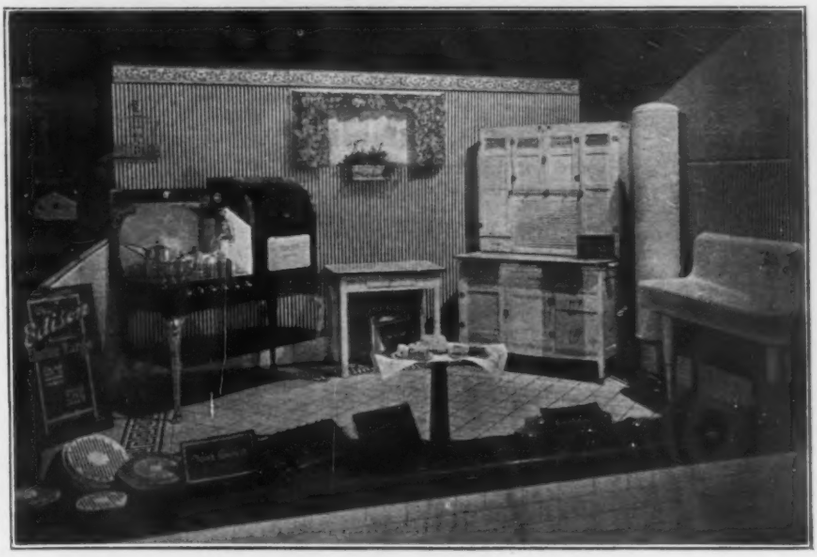
The basement of the store has been devoted to the repair and parts departments. A counter for handling repair orders is located at the foot of the stairs and behind this tiers of bins are provided for holding repair parts and the smaller equipment. This storeroom is meant to take care of local demands of the trade to meet occasional emergencies, but is not the storehouse for handling the wholesale business of the company. The arrangement is designed to show the retail merchant how a complete stock may be carried in the smallest space with the greatest convenience. Dealers who have seen the layout have quickly seen the advantages and in most cases have brought their stocks up to the standard of the service station.

Mr. Rowley's idea in laying out the store has been to provide a place where the jobber or dealer may bring in customers and find a complete stock available for demonstration purposes. The primary function of the establishment is to supplement the merchandising service of the dealer and to put the manufacturer in closer personal touch with the distributing agencies of the electrical industry. The station provides the manufacturer with a force which can be used as a direct follow-up to his printed sales service, through active personal assistance in the case of the individual customer.

The service station has supplemented this personal service that has brought a considerable addition to the amount of local business, with suggestions for special sales campaigns on various appliances. It has also been active in pushing the convenience outlet idea in the entire territory that it serves. In a recent campaign on electric irons, the manager of the station organized the Boy Scouts of Salt Lake City into a sales force to canvass the homes. The retail end of the business went through the hands of the local dealers.

The success of the service station idea has been firmly tested in Salt Lake. The organization there has grown from one employing two people to one of the most important of the Edison Electric Appliance Company's chain of service stations. The volume of business clearing through the office now furnishes employment for four field salesmen, two range specialists, two repair men, a district sales manager, a station manager, a shipping clerk and two stenographers. Repair and service work is done for the states of Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming.

To test the soundness of the idea, a very careful record has been kept of all expenses incident to the service station. It cannot be denied that the service station has built up a great amount of good will for the manufacturer and has brought the merchandising factors closer together, but also it has been found to be a financial success. The returns from the district show ample justification for the continuance of the policy of furnishing this service to the merchandising factors of the industry. The manufacturer will undoubtedly make this a permanent contribution which will react to the benefit of the entire electrical industry in the territory.



A typical window display of the service station, showing how the papered background may be used to form an appropriate setting for a kitchen display. Only a slight change is necessary to make the setting represent any other room in the house. The linoleum is adaptable to other displays.

INDUSTRIAL NEWS

O'Shaughnessy Dam Is Formally Dedicated by Officials

O'Shaughnessy Dam, the City of San Francisco's new dam for impounding water for the city supply, and the Hetch Hetchy reservoir, were dedicated on July 7. A group of San Francisco citizens, guests of the Board of Public Works, were present at the dedication.

W. H. Wattis, president of the Utah Construction Company, formally delivered the completed structure to the city officials. T. A. Reardon, president of the Board of Public Works, accepted the dam for the board, and Mayor James Rolph, Jr. dedicated the dam on behalf of the people of San Francisco.

M. M. O'Shaughnessy, city engineer of San Francisco, for whom the dam was named, briefly outlined the less technical features of the structure. Mr. O'Shaughnessy has been in direct charge of the erection of the dam which was started in 1914.

The new concrete structure is built in the shape of an arc, with a 700-ft. radius. The cost of the dam and reservoir was $6,647,356.34.

The storage capacity of the reservoir behind the dam is 66,000,000,000 gal., and water is supplied the reservoir from a drainage area of 294,000 acres.

The dam is one of the largest masonry dams in the world, as it is 298 ft. thick at the bottom, and the foundation is 114 ft. below the stream bed. The top of the dam is 341 ft. above the stream bed, with a crest 600 ft. long. Tunnels and aqueducts will be used to transport the water to San Francisco.

Municipal Utility District to Be Formed by Sacramento

Embarcation on a municipal water and power development scheme by the City of Sacramento, Calif., was sanctioned by the voters of that city, on July 2, 1923, when they voted for the creation of the Sacramento Municipal Utility District, at the same time electing five directors to proceed with the preliminary steps necessary under the terms of the newly created municipal utility district act. The vote on the measure was 6,378 to 978. It is significant that the total vote was less than 7,700 out of a total regisration of approximately 36,000.

Under the terms of the act, the five directors will immediately perfect an organization, appointing a general manager, a treasurer and an attorney who will hold office at the will of the board and whose salaries will be fixed by that organization.

If the suggestion of H. C. Bottorff, city manager of Sacramento, is carried out, the board will immediately ask the California State Railroad Commission to make a detailed appraisal of the distribution systems of the Great Western Power Company and the Pacific Gas & Electric Company within the district and start condemnation proceedings to acquire these properties. In the meantime the board will prepare the final recommendations from the reports of the engineers who have been investigating the project. These, together with a bond issue to cover the cost of the project, will be submitted to the voters for final approval before the end of the year.

The project, which, it is estimated, will cost approximately $8,000,000, calls for the development of a maximum of 150,000 hp. from the waters of Silver Creek, a tributary of the American River. The two main reservoirs will be at Union Valley, on the main fork of Silver Creek, and at Ice House, on the south fork. The dam at the former point will be 302 ft. high, and at the latter, 138 ft. high. The ultimate impounding capacity of the reservoirs will be 210,000 acre-feet for this watershed, which has an area of approximately 191 sq. mi.

Of the $8,000,000 to be expended on the initial development, $4,000,000 will be spent on the reservoirs, dams and power houses, while the remaining $4,000,000 will be spent on the acquisition of the distribution systems of the two utilities within the corporate limits of the district.

It is understood that the Silver Creek project, upon which the city is planning to embark, was investigated by power company engineers several years ago and that a report was made at that time indicating that the project would not be economically feasible for at least 50 years owing to the high initial cost of the development.

However, before actual construction work can be started by the city, the voters must authorize $8,000,000 in bonds. While the vote on the formation of the district was apparently overwhelmingly in favor of the project, it is pointed out that but slightly more than 20 per cent of the registered voters were sufficiently interested in the project to go to the polls. It is believed that considerably more interest will be aroused when the question of expending money comes before the voters.

The Los Angeles Gas & Electric Corporation celebrated its fifty-sixth anniversary on June 28. On the original staff of the company at the time it was organized were James Hagan, George J. Clark, John Goller, Wallace Woodworth and William H. Perry. The business began with a capital of $35,000. The plants and equipment are now appraised at $17,000,000.

Substation Equipment Purchased by Vancouver Company

The British Columbia Electric Railway Company has let the contract for one 6,000-kva. synchronous condenser, with a 1,000-kw. d.c. generator attached and one 3,750-kva. synchronous condenser, also with 1000-kw. generator attached, to the Canadian General Electric Company. This apparatus, with the necessary switchboard devices, will cost $157,000. The former will be placed in the Main Street substation, and the latter in the Burnaby substation. Correction of power factor is the purpose of the new equipment.

This company plans to erect, at an early date, a 6,000-kva. substation at Port Moody, to replace small transformer stations at Port Moody and Coquitlam, which were destroyed by fire. Step-down transformers, from 34,600 volts to 12,000 volts, will be installed. Current will be delivered direct from the Lake Buntzen hydroelectric plants. The cost will be $55,000.

A new bank of three 500-kva. transformers will be installed in the Cloverdale substation of the British Columbia Electric Railway Company, replacing a similar number of an old air-blast type. This equipment will cost $14,000.

Hydroelectric Power Project in Oregon Issued Permit

A permit has been issued by the Oregon State Engineer, to A. D. Gardner, to appropriate 1,000 sec-ft. of water for power development from the North Santiam River, near Stayton, Ore. Mr. Gardner, according to present plans, will develop a total of 13,636 hp. at four points between Mehama and the present development at Stayton, at an estimated cost of $250,000.

It is proposed to use the power for general commercial purposes and to supply additional power to the industries of Stayton, which are now using 1,500 hp. Any surplus power that may be developed will be sold at wholesale. The accessibility to Salem, Jefferson, Albany and other towns in the central Willamette Valley makes this new development of importance.

A proposal to erect a large hydroelectric plant in the mountains near Colima, Mexico, has been announced by Lawrence C. Morley and associates. Mr. Morley has applied to the Mexican Government for a concession to construct the proposed plant. It is stated that the group of men intend to develop about one hundred thousand horsepower and that they plan to erect transmission lines leading to Colima, Manzanillo and other towns and mining districts.

Franchise Expiration Awaited by Colorado Springs Men

Since the defeat of the franchise sought by the Colorado Springs Light, Heat & Power Company over a month ago, there have been no new developments other than the establishment of a "watchful waiting" policy on the part of both the city and the utility.

The old, or Jackson, franchise, as it was called, expires Sept. 8, and until that time the central station has an official status. Whether the city council will continue its passive policy until that time, or even afterwards, thus allowing the company to continue operation as previously, is not known.

Even with the marked preponderance of sentiment against the renewal of the franchise, the possibility of municipal operation of the utility is no greater, if not less, than it was previous to the election. This is mainly attributed to the convincing report submitted by General George W. Goethals, after making a thorough study of the situation, and in which the noted engineer made conclusions diametrically opposed to a number of those advanced by the expert serving for the city.

With no alternative proposition offered as yet by the city administration, and with the possibility of a receiver being designated to take over the company, years of litigation may result, in the opinion of a number of Western utility operators.

J. D. Ross, superintendent of the Seattle municipal lighting system, has been commissioned by the Colorado Springs authorities to conduct a survey in that district, with the view to the construction of a city-owned hydroelectric plant. Mr. Ross will spend several weeks there.

Completely Electrified Hospital Planned for San Diego

Electrically, the new St. Josephs Hospital, in San Diego, Calif., bids for which have been received, will be one of the finest equipped institutions of its kind in the country. Such were the announced intentions given to the public recently by L. E. Loveless, designer of the institution.

The six-story hospital, with its attendant power house, will occupy a five-acre site about 600 yd. north of the present hospital. It is to be erected at a cost of approximately $500,000. The main structure will be 260x44 ft., and it is planned, will be flanked eventually on either side by wings, 100x42 ft. Spanish Mission style of architecture will be employed, with stucco finish ornamented with artificial stone. Construction is to be Class A, reinforced concrete, with tile filler walls.

Some of the electrical features of the new hospital will be as follows: Each room, besides having individual lavoratory and clothes closet, will be wired with a special power outlet for the use of electrical appliances. It will also have an electric silent signal system, private telephone, and will be connected with a checking annunciator in the office of the superintendent of nurses on the main floor.

Portable X-Ray equipment, capable of being used in every room in the building, will be one of the special features. A complete electro-cardiograph system, with stations on the various floors, will be installed.

The basement of the building will contain an electric refrigerating system, including an ice-making machine. An automatic auxiliary emergency lighting system, operating from storage batteries in case of power shut-off on the central station lines from any cause, will also be located in the basement.

Electric lighting of all rooms and departments is to be given especial care. In the obstetric department, on the fourth floor, and the operating rooms on the fifth floor, lighting will be carefully considered. A special X-Ray operating suite is included in the plans.

Food will be prepared in the main floor kitchens and delivered by automatic dumb waiter to each of the floors. A high-speed elevator service will serve all floors, with an automatic electric bed elevator to serve the surgical department.

In other departments, such as the thoroughly equipped laundry, vacuum cleaning apparatus, examination rooms, dispensary, nurse's home, kitchen and cafeteria, shops, etc., and power house, electricity will also be utilized.

Washington WaterPowerCompany Makes Plant Additions

Improvements costing approximately $35,000 have recently been completed by the Washington Water Power Company of Spokane, Wash. A balancing set for the direct current system has been installed at the Post Street substation in Spokane. The set will replace an obsolete waterwheel balancing set which has been in use in the power station under the Monroe Street bridge. The new set was installed at a cost of about $10,000.

To give duplicate service to the industrial section of the east end of Spokane, the company has recently completed a $25,000 substation at the corner of Havana and Broadway. Recent development in this section of the city has made the addition to the distribution system advisable.

The concrete foundation for the new 23,500-hp. unit at the Long Lake plant of the company has been laid and the waterwheel and generator will arrive the latter part of the summer. This is the fourth unit to be installed at the Long Lake plant. The company has also started work on the foundation for a new unit at the Similkameen River, near Oroville, Wash. A 2,150-hp. unit will be installed there later in the fall.

Masonic Rites Read at Funeral of John A. Britton

Funeral services for John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, were held in the San Francisco Masonic Temple, Van Ness and Market Street, San Francisco, on June 3. The ritualistic ceremonies were conducted by Oakland Lodge, No. 188, of which Mr. Britton was Past Master.

Officers and directors of civic, business and other organizations were present at the funeral. Groups represented the leading organizations of the city. The pallbearers, consisting of Mr. Britton's older associates, were: Charles L. Barrett, Albert C. Beck, Philip E. Bowles, Charles W. Conlisk, Wigginton E. Creed, Charles P. Cutten, Paul F. Downing, Carl E. Heise, George Kirk, Frank A. Leach, Jr., Richard E. Malone and Joseph S. Worthington.

All of the members of the Pacific Service Employees' Association stood for three minutes with bared heads, at the hour of the ceremony.

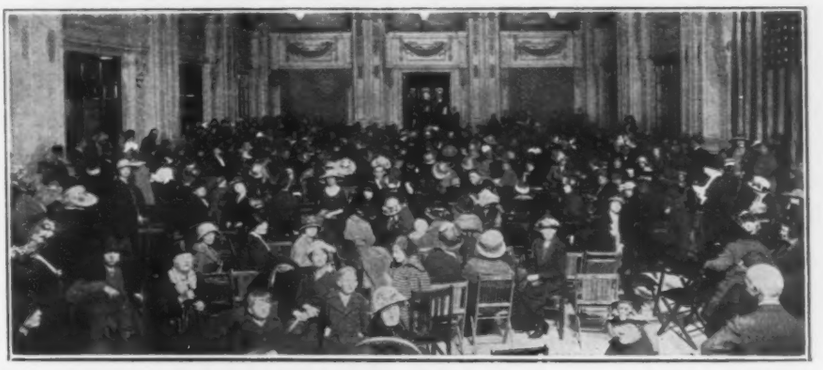
Annual Electric Cooking School Held in Salt Lake City

The annual electric cooking school, conducted by the Salt Lake Telegram, was held in Salt Lake City, Utah, the week beginning June 11. Miss Edith Clift, domestic science expert and demonstrator, gave lectures each day, and by practical demonstrations impressed the many hundreds of housewives who attended with the innumerable advantages of cooking electrically.

Miss Clift featured various recipes and menus, and explained the planning of meals. During the week a large number of prizes were given to successful contestants in various cooking contests.

In addition to exhibits and advertising features displayed by several electrical firms, several merchants entered exhibits and booths at the school. To tie in with this advertising there were many items in the news columns of the Telegram covering the advantages of more extensive use of electricity in the home.

The attendance at each daily session was large, and it was noted that a keener interest than ever was shown by the spectators. Miss Clift introduced many new ideas in the art of cooking electrically. The school was conducted in the ball room of the Hotel Utah, and was the fourth annual event of this kind.



The cooking school held in Salt Lake City was conducted in the ball room of the Hotel Utah. A general idea of the attendance may be obtained from the illustration above.

Transmission Line Certificate Is Granted Idaho Company

The Public Utilities Commission of Idaho has recently canceled a certificate of convenience and necessity, covering a transmission line in Lincoln County, Idaho, granted to the Wood River Power Company, in March, 1922, and has at the same time granted to the Idaho Power Company a certificate covering the transmission line. The action on the part of the commission comes after a request made by both companies that the certificate be transferred to the larger company.

It is the intent to reconstruct the line for 44,000-volt operation, and now that the certificate has been granted to the Idaho Power Company, that company will stand the costs of construction work. The line runs from the town of Shoshone to the town of Richfield. Power will be wholesaled to the Wood River Power Company at Richfield.

Frank A. Leach, Jr., to Succeed the Late John A. Britton

Frank A. Leach, Jr., former manager of the East Bay division of the Pacific Gas & Electric Company, and more recently vice-president in charge of public relations and service, has been named vice-president and general manager of the company, to fill the vacancy caused by the death of John A. Britton.

Frank A. Leach, Jr.

The appointment was made at a meeting of the board of directors of the company, held July 12, 1923.

The new general manager of "Pacific Service" is an Oakland man, having resided there since his early youth. He began his early business training on the Oakland Enquirer, a newspaper owned by his father, Frank A. Leach, Sr., former superintendent of the San Francisco mint and later director of the mint at Washington, D. C.

He entered the public utility service 25 years ago in the employ of the Oakland Gas Light & Heat Company, of which the late John A. Britton was president and manager. Upon Mr. Britton's acceptance of the presidency of the California Gas & Electric Corporation, of which the Oakland Gas Light & Heat Company was a subsidiary, Mr. Leach was appointed to succeed him as manager of that utility and also the Berkeley Electric Lighting Company. Upon the organization of the Pacific Gas & Electric Company, in 1905, Mr. Leach was made manager of the East Bay division. Three years ago he was called to the head office in San Francisco as vice-president in charge of public relations and service.

The following tribute to his qualities is given by Wigginton E. Creed, president of the company:

"Mr. Leach is the logical successor to John A. Britton, who was for so many years in responsible charge of the operations of the company. Mr. Leach has come up through the operating ranks of the company in both gas and electric divisions, with twenty-five years of service to his credit."

Mr. Leach is a member of the San Francisco Chamber of Commerce, the San Francisco Engineers' Club, the National Electric Light Association, and the Illuminating Engineering Society. He was elected second vice-president of the Pacific Coast Electrical Association, at the last convention of that organization.

Transmission Line Survey Being Made in Southern Oregon

Survey work on the transmission line of The California Oregon Power Company, between Roseburg, Ore., and Dixonville, has been started. As soon as the route is mapped out rights-of-way will be secured and actual construction will be started as soon as possible.

The line will connect with the 66,000-volt transmission line between Prospect and Eugene. It is probable that a substation will be erected at Dixonville and another at Roseburg. It is expected that construction on the line will be completed by Sept. 1.

Six miles of line will be necessary to tie-in the system of the Douglas County Light & Water Company with The California Oregon Power Company system. The former company was recently purchased by the larger concern, and the new line is being built to connect the two parts of the power company's system. When this line is completed, the utility will be prepared to supply Roseburg and the Umpquah Valley with all of the power that is needed.

Contract for Transmission Line to Britannia Beach Let

Contract for the building of the 34,600-volt line, from West Vancouver, B. C., to Britannia Beach, a distance of 30 miles, has been awarded by the British Columbia Electric Railway Company to D. Cummings, the price being $72,000. This amount covers poles, crossarms and labor only, the company supplying cable and insulators. Seven-strand aluminum cable will be used with steel core. The additional cost of cable and insulators will be $56,000. A copper-covered telephone circuit will be included.

The reason for using aluminum cable was to reduce the number of poles necessary, owing to the rough country on the route. Altogether, 260 poles will be used. The longest span will be 1,000 ft., with 500 ft. as the minimum. The highest altitude reached by the line will be 1,400 ft,, although the ends will be at sea level.

Clearing for the line was recently completed at a cost of $45,000. The British Columbia Electric Railway Company will use the new line to supply the Britannia Mining & Smelting Company with 4,500 hp.

San Francisco Body Favors Sale of Hetch-Hetchy Power

The board of governors of the Civic League of Improvement Clubs and Associations of San Francisco has gone on record as favoring the sale of power generated at Hetch-Hetchy to a private corporation, at the power house. The board ignored the majority report of a special committee formed to investigate the matter and voted to adopt the minority recommendation.

The supporters of the minority report stated that it would be difficult for the city to raise enough money to either purchase or erect a distributing system and that in addition some provision for stand-by service would have to be made if the city were to distribute this power. M. M. O'Shaughnessy, city engineer of San Francisco, has stated that the city's Moccasin Creek power plant, as the structure below the Hetch-Hetchy reservoir is known, will be ready to deliver power in the fall of 1924. The minority report also states that the city could not possibly be ready to distribute power by that time. The new project will develop approximately 52,000 hp. when the first unit is installed.

No action has been taken by the Board of Supervisors of San Francisco up to the present time. Three proposals have been offered. The first is to sell the power in a block to a private corporation at the power house, the second provides for the city to have a private corporation act as its agent in distributing the power, and the third calls for the city to distribute the power directly.

New Jobbing House is Organized in Oakland, Calif.

Organization of a new electrical supply jobbing house, in Oakland, Calif., to be known as the Electrical Supply Company, has been perfected by Edd. N. Watkins and Lloyd R. Hanlon. The headquarters of the firm have been established at 404 Eleventh Street.

Both men are well known in the electrical industry on the Pacific Coast. Mr. Hanlon has been connected with the sales department of Alexander & Lavenson, San Francisco jobbers, for the past five years. Mr. Watkins was for many years connected with the Home Electric Company of Tacoma, Wash., and for the past three years has maintained a contractor-dealer establishment at Vallejo, Calif. The firm will handle several standard lines of electrical supplies and appliances on a wholesale basis and will cater strictly to the already established distributing outlets.

Second Turbo-Electric Ferry Is Delivered to Owners

The "San Leandro," the second of two turbo-electric ferry boats recently constructed for the San Francisco-Oakland Terminal Railways Company, has been docked at the Key Route pier, on the Oakland side of San Francisco Bay. The vessel was run from San Pedro, where it was constructed, to San Francisco, on its own power.

Minor additions will be made to the boat before it is put in the ferry service of the company. Trial trips will be conducted in San Francisco Bay prior to putting the boat in service.

Illustrated Monograph Features Better Store Lighting

A monograph designed to assist central stations and contractor-dealers in creating a demand for better store lighting has recently been published by the Society for Electrical Development, Inc. The 94-page booklet is entitled "Building Store Lighting Business."

The booklet is designed to be used as a reference volume and is a compilation of data previously published by the organization and other agencies, as well as much new material. A presentation is made of the results of tests held in various cities throughout the United States, in addition to suggestions as to ways of interesting store owners in better illumination.

The new booklet contains a review of the possibilities of show window lighting, from the point of view of the merchant, central station and the entire industry. Reproductions of advertisements suitable for use in connection with a campaign for better lighting are also presented in the publication. Publicity stories, suitable for use in newspapers, are attached to the booklet. These items can be used to supplement the display space purchased by the advertiser.

Copies of the monograph may be secured by addressing the Staff Headquarters of the Society for Electrical Development, Inc., 522 Fifth Avenue, New York, N. Y.

Portland Company Orders Large Motor-Generator Set

An order for the largest motor-generator set used by a public utility company for lighting and power service on the Pacific Coast has just been placed by the Northwestern Electric Company, Portland, Ore. The Westinghouse Electric & Manufacturing Company will build the set which is to consist of one 3,600-hp., 11,000-volt, 3-phase, synchronous motor, direct connected to two 1,250-kw., 275-volt, d.c. generators. The generators will be directly connected to a 28-kw. exciter. The unit will operate at 720 r.p.m.

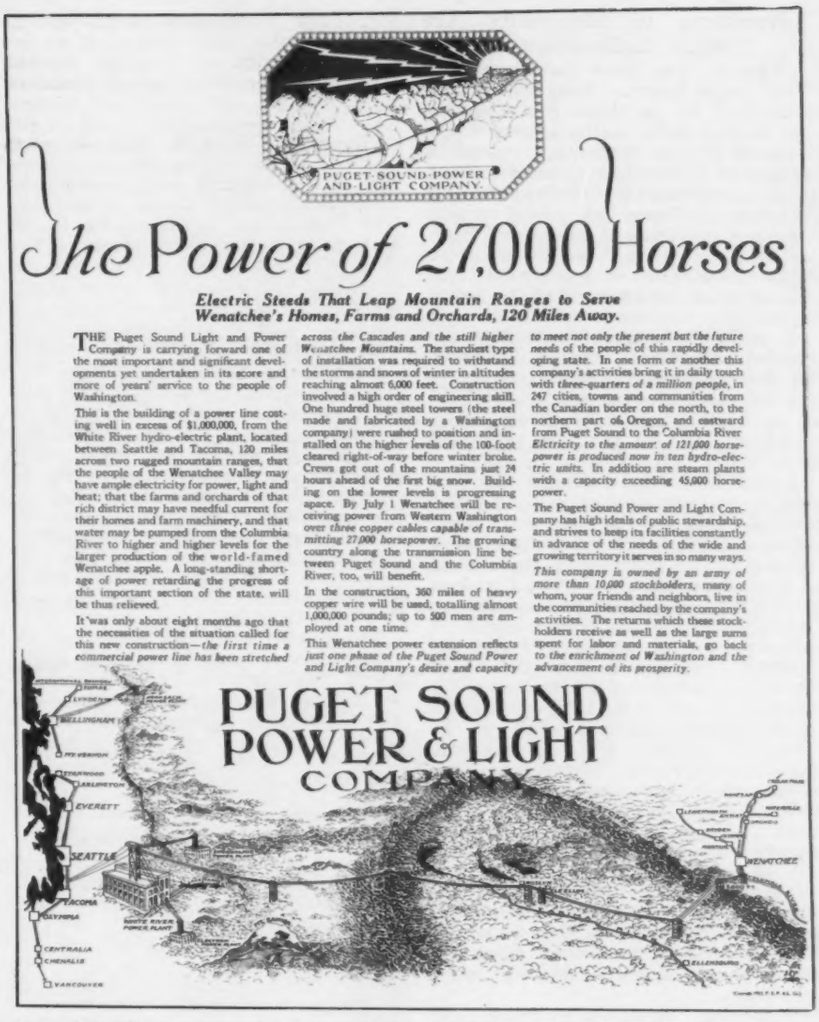
The new motor-generator set will be installed in the Pittock steam plant of the company in Portland. With the addition of the new unit, the direct current generating capacity of the company will be raised to 7,000 kw. There are now three 1,500-kw. motor-generator sets in the company's plants.

History of Industry Presented by Meter Manufacturer

In a booklet of special edition, the Sangamo Electric Company, Springfield, Ohio, manufactureres of Sangamo meters, has presented the historical background of the central station industry. A brief summary is given of the early developments in the discovery of electricity as it affects central station service.

The booklet, which is attractively illustrated, is known as Bulletin No. 63. The title of the bulletin is "Service to the Central Station Industry."

The Lebanon Light & Power Company, owned for the past fifteen years by a group of Lebanon, Ore., business men was sold to the Mountain States Power Company for $100,000.


PUGET SOUND POWER AND LIGHT COMPANY
The Power of 27,000 Horses
Electric Steeds That Leap Mountain Ranges to Serve Wenatchee's Homes, Farms and Orchards, 120 Miles Away.
THE Puget Sound Light and Power Company is carrying forward one of the most important and significant developments yet undertaken in its score and more of years' service to the people of Washington.
This is the building of a power line costing well in excess of $1,000,000, from the White River hydro-electric plant, located between Seattle and Tacoma, 120 miles across two rugged mountain ranges, that the people of the Wenatchee Valley may have ample electricity for power, light and heat; that the farms and orchards of that rich district may have needful current for their homes and farm machinery, and that water may be pumped from the Columbia River to higher and higher levels for the larger production of the world-famed Wenatchee apple. A long-standing shortage of power retarding the progress of this important section of the state, will be thus relieved.
It was only about eight months ago that the necessities of the situation called for this new construction—the first time a commercial power line has been stretched across the Cascades and the still higher Wenatchee Mountains. The sturdiest type of installation was required to withstand the storms and snows of winter in altitudes reaching almost 6,000 feet. Construction involved a high order of engineering skill. One hundred huge steel towers (the steel made and fabricated by a Washington company) were rushed to position and installed on the higher levels of the 100-foot cleared right-of-way before winter broke. Crews got out of the mountains just 24 hours ahead of the first big snow. Building on the lower levels is progressing apace. By July 1 Wenatchee will be receiving power from Western Washington over three copper cables capable of transmitting 27,000 horsepower. The growing country along the transmission line between Puget Sound and the Columbia River, too, will benefit.
In the construction, 360 miles of heavy copper wire will be used, totalling almost 1,000,000 pounds; up to 500 men are employed at one time.
This Wenatchee power extension reflects just one phase of the Puget Sound Power and Light Company's desire and capacity to meet not only the present but the future needs of the people of this rapidly developing state. In one form or another this company's activities bring it in daily touch with three-quarters of a million people, in 247 cities, towns and communities from the Canadian border on the north, to the northern part of Oregon, and eastward from Puget Sound to the Columbia River. Electricity to the amount of 121,000 horsepower is produced now in ten hydro-electric units. In addition are steam plants with a capacity exceeding 45,000 horsepower.
The Puget Sound Power and Light Company has high ideals of public stewardship, and strives to keep its facilities constantly in advance of the needs of the wide and growing territory it serves in so many ways.
This company is owned by an army of more than 10,000 stockholders, many of whom, your friends and neighbors, live in the communities reached by the company's activities. The returns which these stockholders receive as well as the large sums spent for labor and materials, go back to the enrichment of Washington and the advancement of its prosperity.
PUGET SOUND POWER & LIGHT COMPANY
BELLINGHAM
EVERETT
SEATTLE
TACOMA
OLYMPIA
CENTRALIA
CHEHALIS
VANCOUVER
WENATCHEE
ELLENSBURG
WHITE RIVER POWER PLANT

A sample of the newspaper advertising employed by the Puget Sound Power & Light Company.

Puget Sound Company Conducting Advertising Campaign

To promote good will in the territory that it serves, the Puget Sound Power & Light Company has recently been conducting an advertising campaign, which has been presented through approximately 100 newspapers in northern Oregon and Washington. The company operates in 247 cities from northern Oregon to the Canadian border.

In general, the campaign has been an educational one, showing the readers the extent of the company's holdings. An effort has also been made to impress upon the company's customers the amount of power that it is providing for the use of its patrons. The results have been very satisfactory, according to reports from the company, and it is probable that the campaign will be continued.

Linked with the good will idea is the sale of stock to the consumers. Each advertisement carries with it a suggestion of the value of the company's securities. In addition to this, a parallel campaign is being carried on by the Puget Sound Power & Light Securities Company, a subsidiary organization formed for the purpose of dealing in stocks, notes and bonds of the parent company. The advertising employed by this company is very similar to that of the central station company and also endeavors to create good will.

The Citizens' Club of Chehalis, Wash., has received a telephone franchise from the State of Washington, under which it may erect a line to Randle in the Big Bottom country, along the route of the Pacific Highway from Chehalis to Jackson Prairie, thence by the National Park Highway. It is planned also to build a line from Jackson Prairie to Lewis and Clark State Park, at the south end of the prairie. Plans of the promotors of the project are the construction of a telephone line with the object of bringing eastern Lewis county and intermediate points into direct communication with Chehalis.

The third conduit, planned to bring Bull Run water from the headworks, 25 miles east of the city, to the Portland, Ore., reservoirs will be constructed without further delay. The new pipe line is estimated to cost between $2,500,000 and $3,000,000 and engineers of the water department declare that it should be completed by 1925. It will follow a route separate from the routes of the two pipe lines that now bring Portland's water supply to the city.

Advantages of Electricity Are Told in Radio Concerts

"Electra, Our New Laundress," or "How to Be Happy, Though Working," could well be the subject of some of the weekly radio matinees now being featured by the Electrical Cooperative League of Denver in conjunction with a local broadcasting station. Every Thursday afternoon for several months talks and advice on all phases of "Electricity in the Home" have been given by members of the league staff of specialists from some branch of the industry.

A complete program embracing the general subject was mapped out by S. W. Bishop, executive manager of the organization, in order that every phase of application might be given proper treatment, and so that the talk each week would be interesting in itself.

Proper wiring in the home was covered by an introduction and a personally conducted tour through an "aerial" model electrical home. Details were given as to the furnishings, the scheme of decorations and the exact locations of electrical equipment and appliances. One floor of the house was explained each week for three weeks and then the program was retraced to the point where a radio "demonstration" of heating devices and small table appliances could be given treatment.

Vacuum cleaners of all types and their vital points of difference without mention of trade names were explained under the title of "Cleaning by Electricity." The subject of laundrying was reviewed in two parts, the first in reference to the washing machine and the second on ironing machines and the hand iron. To make the subject more realistic discussion was also given to the placement of the laundry tubs, the necessity of good drains, laundry chutes, etc.

Convenience outlets were frequently mentioned in every talk. It was explained that those were the devices which really made possible the fullest possible use and a very flexible application of all types of appliances and even portable lamps. Reports were received from several Denver contractors after the talks that direct orders had been received for the installation of outlets as a result of the radio matinees. The second phase of the talks will cover home lighting.

That considerable interest has been developed in the mountain region as a result of the talks is evidenced by the comment made in some of the country papers relative to the groups of women who meet every Thursday at some friend's home to "be educated electrically" via the loudspeaker. The Denver league has also received letters asking for detailed information on electrical subjects as a result of the talks.

To give exposition to another phase of the industry's problems the league invited the Rocky Mountain Committee a ten-minute discourse each week on good will, tax exempt securities, municipal and private ownership, and similar subjects. George E. Lewis, executive manager of the committee, gave the talks.

With the proposal of the establishment of a high-powered broadcasting station in Denver soon, the electrical industry there, it is said, will then double its efforts along lines of educational talks in order that every nook of the mountain region can be easily reached with its interesting and informative messages.

Reorganization of the Burns Electric Light & Power Company, of Burns, Ore., will be effected soon, according to a report sent to the Oregon Public Service Commission in Salem by H. M. Horton, president of the company. The company has been struggling along for two years with an annual loss of $2,000 according to Mr. Horton.

San Francisco Branch Banks Aid in June Bride Campaign

In continuance of its policy of presenting window displays of timely interest, the Mercantile Trust Company of California, during June Bride Week, presented a typical electrical exhibit in several of its branch bank windows. The company operates a number of branch offices in the San Francisco Bay territory and the window trim was presented in a number of locations in which it might not have been were it not used by the banking company.

The window that was presented required only a small amount of work, but it was particularly attractive. A small bride and groom were used to lend atmosphere to the window, and in the center of the window some piece of electrical equipment was shown. The card of the California Electrical Cooperative Campaign was also displayed in the window.

The same scheme of decorating the window was used in all of the branch offices. The electrical equipment that was displayed was borrowed from contractor-dealers in the vicinity of the bank.

Program Perfected for Meeting of Contractors and Dealers

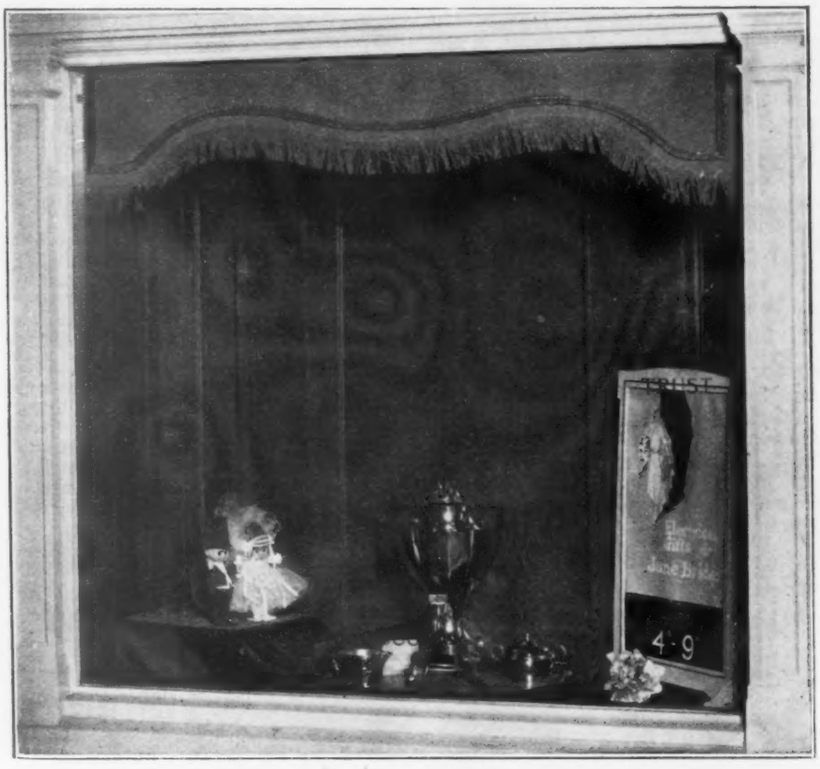
Arrangements have been completed for the San Francisco conference of the Pacific Coast Division of the Association of Electragists International, to be held at the Palace Hotel, July 23, 1923. The occasion of the conference is the annual visit of James R. Strong, president of the association. Mr. Strong is accompanied on his visit by Laurance W. Davis, director of the association, and O. C. Small of the Society for Electrical Development.

The program for the afternoon open session will include an address on "The New York City Movement—The Eidlitz Plan," by Mr. Small, a talk on "Estimating and Selling the Job," by Mr. Davis, and an address on "Overcoming Sales Resistance to Electrical Sales," by Mr. Small.

At 6 p.m., an informal dinner will be tendered the three visitors, at the Palace Hotel. This will be followed by a special meeting in the evening, for contractors and dealers, in which Mr. Strong will discuss the activities of the association. Mr. Strong will be the speaker of the day at the regular meeting of the San Francisco Electrical Development League, on Monday, July 23.

The United States Civil Service Commission has announced that it will hold an open competitive examination for the position of electrical draftsman in the Bureau of Yards and Docks. Applications will be received until Aug. 7.

Stephen I. Miller, Jr., dean of the School of Business Administration of the University of Washington. was the guest of honor and principal speaker at the June 21 weekly meeting of the Electric Club of Seattle.



Displays similar to this one were put in the windows of several of the branch offices of the Mercantile Trust Company of California, in the San Francisco Bay region, during June Bride Week.

Meetings

San Diego Electrical Retailers Form New Association

Following the example set by the electrical contractors of San Diego County, the electric dealers of San Diego, Calif., decided to organize an association for the promotion of mutual benefits through the education of the public to the use of electrical appliances and convenience outlets. The first meeting of the embryo Electrical Dealers' Association of San Diego County was held, June 22. At this time a tentative code of ethics was drawn up, similar in spirit to that which the electrical contractors pledged themselves earlier in the month.

The chief difference in the two codes is in the provisions in the dealers' association code for the selection and education of employees. Employees, clerks or salesmen are to be carefully selected as to honesty, ability and anxiousness to learn the benefits of electricity and its applications in home use. Training of employees to eliminate false statements, disparaging statements concerning competitors, and to promote the education of the public to electricity, are the principal clauses. Truth in advertising, careful buying, courteous servicing of appliances, non-infringement on the agency rights of competing dealers in handling special brands of appliances, refraining from offering commissions to employees of other firms, or employing in any capacity members of other firms, and the agreement that no contract not approved by the association be entered into by any dealer member with any customer, are other leading features of the code.

Another meeting is to be held this month, for the completing of the organization of this association.

Plans for Regional Meetings of Contractor-Dealers Made

Preparations for two of the regional meetings of the Association of Electragists, International, have been completed. These meetings are to be attended by James R. Strong, president of the organization, Laurence W. Davis, director of the promotion and development department of the association, and A. P. Peterson, western field representative.

The first meeting to be held in the West will be held at Denver, Colo., on July 16. From Denver the association representatives will go to Salt Lake City, Utah, on July 18, and then to Los Angeles, where a meeting will be held, July 20.

The program for the Denver convention has been arranged by E. C. Headrick, representing the Mountain Division on the national executive committee, and H. Alex Hibbard, secretary and treasurer of the Denver Electrical Contractors' Association, Inc. This will be the first convention ever held by the Mountain Division of the international association.

The convention program will open with a luncheon which will be followed by an afternoon business session at which President Strong will preside. At the afternoon meeting, Mr. Peterson will speak on "Residence Wiring Survey," while Mr. Davis will talk on "Estimating and Selling the Job." John F. Greenawalt, publicity manager of the Mountain States Telephone & Telegraph Company, is the only Denver speaker listed and his subject will be "Organization."

President Strong will be the principal speaker at the banquet to be given in the evening. The reception committee appointed by the Denver contractors for the occasion includes John W. Hancock, D. D. Sturgeon and Clark Rider.

A luncheon under the auspices of the Electrical Contractors and Dealers Association of Los Angeles will be given the visitors, at the Jonathan Club, at noon on July 20. The luncheon will be informal and will be attended by a few of the leaders of the industry in Los Angeles. In the evening, a banquet will be held, at the Paulais Cafe, to which all of the electrical contractors and dealers of southern California will be invited. At this meeting, addresses will be presented by President Strong, Mr. Davis and O. C. Small of the Society for Electrical Development.

The officers of the Los Angeles local association are to be responsible for the meetings that will be held there. The officers are: H. H. Walker, president; G. E. Arbogast, vice-president; C. T. Smallcomb, vice-president; F. E. Elser, vice-president; E. J. Pineau, secretary-treasurer, and Helen I. Miksell, executive secretary.

COMING EVENTS

Rocky Mountain Division — National Electric Light Association—
Annual Convention—Glenwood Springs, Colo.
Sept. 17-19, 1923

Colorado Public Service Association—
Annual Convention—Glenwood Springs, Colo.
Sept. 17-19, 1923

American Institute of Electrical Engineers—
Pacific Coast Convention—Del Monte, Calif.
Oct. 2-5, 1923

New Officers Elected by Denver Cooperative League

Preparatory to launching its third campaign in Denver, the Electrical Cooperative League of that city held its annual election of officers, June 27. O. L. Mackell, chief clerk and office manager of the Denver Gas & Electric Light Company, was unanimously elected chairman, as were the other officers. D. D. Sturgeon, a prominent electragist, was chosen vice-chairman, while Dean D. Clark, Denver commercial manager of the Mountain States Telephone & Telegraph Company, was named as treasurer. R. W. Elliott of the Albert Sechrist Manufacturing Company was re-elected secretary.

Immediately after the election, the new chairman appointed skeleton committees to undertake the membership drive and financial development part of the League's program until the membership of the advisory board was completed. Previously a recommended program for the fiscal year, starting July 1, was adopted. This provides for a budget of $13,500, an increase of $3,000 over last year. Quotas for the manufactureres, jobbers and central stations were increased, while that of the contractor-dealers was decreased.

The first group to report a complete subscription to the campaign was the jobbers. The eight eligible firms in Denver at one meeting pledged their full quota of $2,300. According to the latest reports, the other three divisions are engaged in an arduous campaign to meet their quotas.

In addition to the further development of field activities, the principal item of interest in the new program of the League is the installation of a commercial - industrial lighting exhibit, space for which has already been established at the League headquarters.

Cooperative Talk Presented to Vancouver Electragists

Kenneth A. McIntyre, special representative of the Society for Electrical Development, addressed a joint dinner of the members of the Vancouver Association of Electragists, International, and the Electrical Service League of British Columbia, at the Hotel Elysium, on June 26. In the absence of E. E. Walker, chairman of the Advisory Council of the Electrical Service League, John R. Read, local manager of the Canadian Westinghouse Company, presided.

The subject of Mr. McIntyre's address was "League Work—Its Purposes, Possibilities and Limitations." Mr. McIntyre stated cooperative work was preparing the consumer through various mediums of publicity for the individual effort of the contractor-dealer, manufacturer, jobber and central station representative. He stressed the point that cooperative work could never hope to supplant the results of individual effort, but that through cooperation the individual could receive the benefit of much publicity which could not be financed by any particular branch of the industry alone. He also stressed the fact that the electrical field was far from saturation, either as to wiring, lighting, or appliances, and that the industry as a whole must not overlook the opportunity afforded through league work to break down sales resistance on the part of the public.

Following Mr. McIntyre's address, an open forum was held for an hour, the chief topic under discussion being the solution of the present unsatisfactory system of distribution, which gave the contractor-dealer branch of the industry little or no protection as against large consumers. It was apparent from the number of contractor-dealers who spoke on this point that the question of protection as against consumers is of vital importance to that branch of the industry and that the problem must be solved at no far distant date by the industry as a whole.

The industrial and commercial section of the recent Elks' Circus, held in San Diego, Calif., in Balboa Park, gave an opportunity to several of the electrical dealers and the central station of the city to present displays of electrical equipment. The San Diego Consolidated Gas & Electric Company booth was filled with exhibits designed to show the growth of the utility company during the past ten or more years.

Personals

Laurence M. Klauber, elected president of the Pacific Coast Electrical Association, at its seventh annual convention in San Francisco, June 19-23, has gradually and with surety climbed to positions of prominence since he graduated from Stanford University's department of electrical engineering, in

LAURENCE M. KLAUBER

1908. Mr. Klauber, a native of San Diego, continued his training as a Westinghouse graduate apprentice during 1908-1910. Returning to San Diego he entered the employ of the San Diego Consolidated Gas & Electric Company, in 1910, as a new business solicitor. Subsequently he became engineer of records, superintendent of the electric department, assistant general superintendent, general superintendent, and is now vice-president and general superintendent. Mr. Klauber is a member of the American Institute of Electrical Engineers, American Society of Mechanical Engineers, American Society of Civil Engineers, American Chemical Society, and other technical and scientific societies. He is a director of the Pacific Coast Gas Association and secretary-treasurer of the California Gas Research Council. Last year Mr. Klauber was chairman of the Overhead Systems Committee, National Electric Light Association, and member of the Prime Movers, Safety Rules and Inductive Co-ordination Committees. He is also vice-chairman of the Technical National Section.

George E. Lewis, executive manager of the Rocky Mountain Committee on Public Utility Information, is engaged in a two month's tour through the states of Colorado, Wyoming and New Mexico acquainting himself more directly with the central stations and in establishing contact with the newspapers throughout the region.

W. G. Murrin, who was recently appointed vice-president in charge of operations on the mainland of the British Columbia Electric Railway Company, Ltd., has returned to his headquarters at Vancouver after an extended trip to England.

John J. Cooper, past chairman of the Electrical Cooperative League of Denver and a prominent jobber in that city, has just returned from an extended eastern trip which included attendance at the Electrical Supply Jobbers' Association convention at Hot Springs, Va., and the N.E.L.A. convention in New York City.

James C. Bennett, comptroller of the Westinghouse Electric & Manufacturing Company, was elected a director of the company at a meeting of the stockholders, June 13, in the place of John R. McCune, who died May 14. **Edwin F. Atkins** of E. Atkins & Company, Boston, Mass., **Samuel M. Vauclain,** president of the Baldwin Locomotive Works, Philadelphia, Pa., and **E. M. Herr,** president of the Westinghouse Electric & Manufacturing Company, were re-elected on the board of directors at this meeting.

E. M. Breed, for several years past assistant manager of sales for the Pelton Water Wheel Company, has been appointed sales manager for the company, with headquarters in San Francisco. Mr. Breed has had a wide experience in hydroelectric work, having been connected with the Pelton Water Wheel Company in various capacities for the past fifteen years.

E. Whitmore, first vice-president and treasurer of the Manhattan Electrical Supply Company, New York, officially retired from the company on July 1. He has been with the company for 33 years and rose from the ranks to the position he held at retirement.

Charles F. Oehlmer, for a number of years a member of the electrical inspection force in Denver, has been appointed chief inspector by Mayor Stapleton to succeed **Charles Oliver.** The labor convention held before the municipal election recommended his appointment which was also given indorsement by the electrical union of which he is a member.

A. F. Wakefield was elected vice-president of the F. W. Wakefield Brass Company of Vermilion, Ohio, at the annual meeting held recently, the other officers remaining unchanged. Mr. Wakefield joined the company four years ago as assistant to the sales manager, and has made rapid strides in the organization.

F. E. Weymouth, engineer-in-chief of the Reclamation Service, was named by Secretary of the Interior Work, effective July 1, a member of the committee investigating the Columbia Basin and Umatilla Irrigation projects. The committee now consists of **Francis M. Goodwin,** Assistant Secretary of the Interior; **David W. Davis,** Commissioner of Reclamation; and **F. E. Weymouth,** Chief Engineer.

D. J. McCarthy, superintendent of gas production at the Potrero plant of the Pacific Gas and Electric Company in San Francisco, spent his vacation visiting gas plants in other parts of the state, notably the south. San Diego and Los Angeles were in his itinerary.

J. H. Jamison, manager of the merchandising division, Los Angeles office, Westinghouse Electric & Manufacturing Company, has just recently returned from a two weeks' visit to El Paso, Texas, where he has been investigating the merchandising of electrical appliances in that section with the Mine & Smelter Supply Company, Westinghouse agent jobbers in that territory.

Clifford H. Langford, chief correspondent of the San Francisco office of the Westinghouse Electric & Manufacturing Company, has recently returned from Washington, D. C., where he attended the Shriner's annual convention. While in the East Mr. Langford visited the principal offices of the Westinghouse company, spending some time at New York, Pittsburgh, East Pittsburgh and Chicago.

H. A. Wegener, has just joined the Los Angeles office of the Westinghouse Electric & Manufacturing Company in the capacity of insulator specialist. Mr. Wegener has for the past four years been insulator specialist of the St. Louis office of the Westinghouse Company and for a number of years prior to that time he was in the insulator department of the Westinghouse factory in East Pittsburgh.

E. R. Owen, division manager of the Utah Power & Light Company at Logan, Utah, has gone to Seattle on business connected with his company.

George Kidd, general manager of the British Columbia Electric Railway Company, Ltd., Vancouver, B. C., has been appointed president of the company by the board of directors as the result of a recent meeting in London. At the same time **W. G. Murrin,** assistant general manager, has been made vice-president in charge of operations on the mainland and **A. T. Goward,** manager at Victoria, has been appointed vice-president in charge of operation of the Vancouver Island system. These changes are the result of recommendations of Sir Ernest M. Harvey, one of the directors who recently visited the company's properties in Canada. No change in duties will take place, Mr. Kidd remaining in charge of the company's entire policies and holding power

GEORGE KIDD

of attorney for the board in London. Mr. Kidd is one of the outstanding figures in the electrical industry in British Columbia. He was the first chairman of the advisory committee of the Electrical Service League of British Columbia and was one of the factors in the success of that organization. He is a strong advocate of the policy of cooperation between the central station and the electrical dealer. It is believed that the announcement of the change in the titles of the various executives presages the passing of the actual control of the company from London to British Columbia.

General George W. Goethals, noted engineer, is a recent Los Angeles visitor. While in the Southwest, Mr. Goethals made a brief tour of inspection of some of the dam sites on the Colorado River.

C. R. Dederick, manufacturers' agent of Portland, Ore., spent several days in Los Angeles recently.

J. R. Viets, for many years in charge of the shipping department of the General Electric Company's Lynn Works, and more recently traffic representative for the New England district, has been appointed assistant traffic manager with headquarters at River Works, West Lynn, Mass.

D. D. Sturgeon, newly elected vice-chairman of the Electrical Cooperative League in Denver, after attending the Rotary club convention in St. Louis as a delegate, has extended his vacation with an eastern trip.

J. C. Davidson, manager of the electrical department of the Hendrie & Bolthoff Manufacturing & Supply Company, has been named head of the electrical supply jobbers organization operating in the Denver territory.

George L. Meyers of Portland, assistant to the President of the Pacific Power & Light Company, has been elected to the position of the president of the Northwestern Electric Light and Power Association. Mr. Meyers has for several years been active in the association and a constant worker. He was born in Redfield, S. D., February 25, 1889. He obtained his education in the public schools and at the early age of 14 was employed as printer and reporter for a weekly newspaper known as the "Press." Three years later he became one of the editors of the paper and here developed a fondness for press work that stands him in good stead at the

GEORGE L. MEYERS

present time. Finding his training was insufficient he enrolled with the Baker City Business College at Baker, Ore., from which he graduated in 1907 to become a public stenographer. March, 1909, found Mr. Meyers clerk of the Oregon State Senate and a little later private secretary of the Hon. Will R. King, Associate Justice of the Supreme Court. A little later during this same year he came to Portland and entered the employ of the Oregon-Washington Railway & Navigation Company as a stenographer to the vice-president and general manager. A year later Mr. Meyers threw his lot with the public utilities by accepting a position as a stenographer to the president of the Pacific Power & Light Company, and the Portland Gas & Coke Company. Two years later he was advanced to the position of assistant to the president, which position he still holds. For the past six years Mr. Meyers has had no small part in the affairs of the association which he now heads. Beginning in 1917 as secretary-treasurer, he has served in one capacity or another until the present. As vice-president for Oregon and a member of the executive committee he has served continuously since 1919. During the past association year he was chairman of the executive committee of Public Relations section. He has also been active in the Pacific Coast Gas Association, having been a member of its board of directors and chairman of the committee on Legislation and Taxation. At present he is a member of the committee on Public Relations and chairman of the committee of the Gas Association dealing with Public Ownership of Securities. In addition to all of the above duties he still finds time to edit two house organs, the Pacific Power & Light Company Bulletin and the Bulletin of the Portland Gas & Coke Company.

H. A. Joslin, who has for four years been The Dalles manager of the Mountain States Power Company, has resigned that position to take up new work in Portland.

J. P. Pulliam of Milwaukee, Wis., president of the Eastern Oregon Light & Power Company, accompanied by **C. V. Seastone** of Madison, Wis., are in Baker, Ore., making a tour of inspection of the companies' holdings. They attended a recent stockholders' meeting in Baker at which the officers were re-elected for another term.

R. F. Walter, assistant chief engineer of the United States reclamation service; **J. L. Savage,** designing engineer, and **James Munn,** engineer, of the same force, spent the early part of June in Salt Lake City and vicinity as a board to report on the Utah lake division of the Great Salt Lake Basin investigation now being made by the state and reclamation service.

Robert Houston, electrical engineer for the Irrigation Commission of New South Wales, spent several days in Salt Lake City during June. Mr. Houston is studying electrical distribution problems in connection with service to rural communities.

Franklin S. Terry, co-manager of the National Lamp Works, Nela Park, Cleveland, was elected vice-president of the General Electric Company, and **B. G. Tremaine,** also co-manager of the National Lamp Works, was elected a director of the General Electric Company at a recent meeting of the board of directors held in New York City.

Rodney J. Bardwell and **C. W. Oehlmann** of the Denver Gas & Electric Light Company were the principal directors of the recent carnival and initiation of new members staged by the Denver Motor Club, which brought the membership of the organization up to a new record, the highest of any commercial or non-fraternal body in Colorado.

W. C. Sterne, prominent Colorado central station operator, was a visitor in California on his way to Hawaii where he will spend the summer with his son and daughter.

S. W. Bishop, executive manager of the Denver Electrical Cooperative League was a speaker on the Better Homes Show program in that city, June 23, which was designated as electrical night.

Victor Lemoge, San Francisco contractor-dealer, was elected president of Division 1 of the California State Association of Electrical Contractors and Dealers for the coming year at the recent convention of that organization at Donner Lake. Division 1 comprises the northern half of California. Mr. Lemoge succeeds E. Earle Browne of the firm of Browne-Langlais of San Francisco. Mr. Lemoge was born in Oakland, Calif., in 1884. He entered the electrical industry approximately 25 years ago as an electrical helper in the old Gas Consumers' Association. During the succeeding years he worked for

VICTOR LEMOGE

various contracting firms in San Francisco and seven years ago entered business for himself. Mr. Lemoge takes over the reins of the Association at a most auspicious time in the history of the organization for plans were perfected at the recent convention for widening its scope so as to include in its membership practically every electrical constructionist and retailer in the northern half of the state. The final details of the membership campaign which is to be undertaken in the near future are being perfected by the executive committee of the organization at the present time and will be announced in the near future. The California association has been one of the most active in the country and the electrical dependability symbol which it has adopted as its trade mark has had a far reaching effect.

Obituary

Leonard E. Curtis, widely known capitalist, and formerly a member of the electrical engineering firm of Curtis & Hine in New York City, died at his home in Colorado Springs, June 30, after a brief illness. He was former chairman of the Colorado State Highway Commission and held extensive mining interests in Mexico.

Manufacturer, Dealer and Jobber Activities

Betts & Betts Corporation, New York, has placed on the market a new receptacle flasher which is known as Type No. 005-R. The new flasher is smaller than the old type and is especially adaptable to window display signs. An adjusting screw in the bottom makes it possible to regulate the flashing action through a hole in the bottom of the sign without removing the face of the sign.

Uehling Instrument Company, Paterson, N. J., manufacturers of CO_2 recorders and draft vacuum gages, has recently made two agency appointments. The new agents are: Amsler-Morton Company, Fulton Building, Pittsburgh, Pa., for western Pennsylvania and John A. McWowell, 2039 Railway Exchange Building, St. Louis, Mo., for eastern Missouri and southern Illinois. H. R. N. Johnson, who formerly represented the Uehling Instrument Company in Minnesota and the Dakotas, has joined the W. P. Nevins Co., Minneapolis, Minn., which company is now the official Uehling representative, in the territory mentioned.

The Westinghouse Electric & Manufacturing Company has recently prepared for distribution to the trade, the Westinghouse Supply Catalog for 1923-24. Only a slight revision has been made in the catalog. The catalog is indexed according to subjects and to sections and in addition a classified index has been placed in the introductory section. The book contains about 1,300 pages of descriptive matter, technical data, dimension drawings, specifications and prices.

The Martin Products Company, San Francisco, Calif., is now manufacturing the Kercher Electric Cooker. The cooker has a combination of the electric oven and fireless cooker principles. H. J. Gute & Company, 150 Post Street, San Francisco, are the Pacific Coast representatives.

The F. W. Wakefield Brass Company, Vermilion, Ohio, is erecting an addition to its plant which will increase manufacturing space about 20 per cent. The company manufacturers "Red Spot" hangers and other lighting specialties.

Landers, Frary & Clark, through their Denver, Colo., representative, H. W. Woeber, are assisting the Moore-Bird Company in the development of an electric appliance department that will feature Universal equipment. The Denver concern was recently organized as a hardware distributing agency.

B. F. Sturtevant Company, Boston, has recently purchased the plant of the Wisconsin Engine Company at Corliss, Wis. A full manufacturing and engineering staff will be maintained at the plant in order that better service may be given western customers.

The Majestic Electric Appliance Company, Inc., San Francisco, Calif., has recently issued a four-page folder on Majestic round-type electric heaters and combination electric pancake and waffle irons. Complete description of the various types of air heaters is presented along with illustrations. The combination irons are also illustrated.

The Jeffery-Dewitt Insulator Company, Kenova, W. Va., is distributing a new catalog covering its products in high tension insulators. The company has also prepared for distribution Bulletin No. 5 which gives electrical and mechanical characteristics of flange-type insulators for switching equipment, bus supports, etc. The booklets may be obtained by addressing the executive sales office of the company at 50 Church Street, New York City.

The Capitol Hill Electric Company is the newest exclusive electric shop in Denver, Colo. The establishment is owned by Paul Edwards and is located at 3325 West Colfax Avenue. A complete line of appliances will be handled and a display of exclusive lighting fixtures for the home will be featured, according to the original announcement.

No, this is not the manager of Donner Lake Camp, as one might imagine. The gentleman is the sales manager of the Steel Cities Electric Company and is trying to keep up the Pittsburgh atmosphere to which he is accustomed. In his home town, he would not be recognized if he were to show up unaccompanied by the smoke screen, so, in order to look natural to other Pittsburghonians, V. G. Fullman had to smoke the stogie. It is understood that Mr. Fullman really enjoyed getting away from the smoke-laden air of his headquarters, and still further enjoyed his outing with the contractor-dealers at their Donner Lake camp.

The Denver Gas & Electric Light Company, Denver, Colo., has given complete charge of the washing machine department to George Williams of the 1900 Washer Company. Mr. Williams has organized a special sales force to work in the residential section of Denver.

Baker-Joslyn Company, San Francisco, Calif., has recently been appointed exclusive Pacific Coast distributor for the Everstick Anchor Company. The distributor is carrying a complete line of the manufacturer's products.

The Jerome Battery & Electric Company, Jerome, Ariz., has been purchased by J. F. Crandall of Jerome. The establishment was formerly owned by Marshall Cain.

The Johns-Pratt Company, Hartford, Conn., has prepared Catalogs No. 51 and 52 describing the Noark service system manufactured by the company. The line of enclosed service switches is described. Noark meter-adapters are also treated in the booklets. Service and testing connections are suggested in Catalog No. 52.

The Sangamo Electric Company, Springfield, Ill., has recently published Bulletin No. 62, which supersedes Bulletin No. 58. The bulletin describes the locomotive-type ampere-hour meters manufactured by the company. Principles of operation as well as a complete description of the meter are given in the booklet.

The Russell Electric Company, Chicago, Ill., has recently placed on the market the "Hold-Heet" electric iron. The iron has several new features including a specially designed handle. The ironing surface is of nickel-plated steel.

The Louis Allis Company, Milwaukee, Wis., has recently announced two Pacific Coast agencies. H. M. Thomas Company, Oakland Bank Building, Oakland, Calif., has been given the exclusive agency for the State of California, and E. H. Albrecht & Company, Lewis Building, Portland, Ore., have been appointed sales agents for the state of Oregon.

The Ajax Electrothermic Corporation, Trenton, N. J., has published Bulletin No. 3 which describes the line of Ajax-Northrup high frequency induction furnaces and the Ajax-Northrup 35-kva. converter. The new converter is designed for use with the furnaces manufactured by the company. The bulletin contains data showing the kilowatt hours required for melting various metals at 100 per cent efficiency of the furnaces.

The Western Electric public address system was recently installed at the Tournament of Roses Stadium in the Arroyo Seco, Pasadena, Calif., where the graduation exercises of all the Pasadena High Schools took place. With this system installed more than 25,000 people who witnessed the exercises were able to hear all of the speakers audibly.

The Holophane Glass Company, Inc., New York, N. Y., has issued a new publication entitled "Holophane Datalog." This is a 38-page illustrated booklet in which the first fifteen pages are devoted to illuminating engineering data and includes utilization coefficients for all types of Holophane luminaires and reflectors, worked out for various size rooms with various wall and ceiling reflection factors. The remainder of the booklet is devoted to description and data on the more popular Holophane luminaires and reflectors. Typical phometric distribution curves are shown for each type reflector.

The Apex Electrical Distributing Company, Cleveland, Ohio, has announced that Albert E. Richter, formerly northwest district manager for the company, has been named national sales promotion manager. Mr. Richter will have his headquarters at Cleveland. B. D. Schock has been named to fill the vacancy left by Mr. Richter and will have his headquarters in Minneapolis.

Trade Outlook

San Francisco

Little change in general business conditions has been noted in San Francisco during the last two weeks. The general tendency has been to buy for immediate needs. Leading jobbers have reported that stocks are not large in general lines, and that orders for fall are being received. The usual slackening of trade which accompanies the summer months has been noticed, but cool weather has retarded seasonal purchases of summer apparel. During the last week warm days have increased the demand for light clothing.

There seems to be no slump in building activity. The demand for building materials continues good and prices are firm. Labor is well employed at high wage scales.

The fruit crop is large and the railroads are handling it to the satisfaction of the growers. Grain crops are good. The movement of all classes of freight is exceptionally large.

In a recent compilation of the San Francisco Chamber of Commerce, it is stated that over five hundred new industries have located in the city during the first half of the current year. A capital investment of $3,798,200 is represented in these industries.

Bank clearings for the two-week period ended June 28, were $307,400,000, as against $267,100,000 for the same period in 1922.

Salt Lake City

Dividend disbursements by the metal mines of Utah for the first six months of the current year were more than double those of the first half of 1922. The period of the last six months has been a record-breaking one for the silver-lead producers of this section.

Building activity continues to be one of the best indications of good conditions in this section, and it is predicted that in Salt Lake City the present year will mark a period of more building activity than has been witnessed in many years.

Electrical jobbers are handling considerably more business than for the same period of last year, and are very optimistic as to the future. Crop conditions are excellent in practically all of the intermountain agricultural sections.

All of these factors indicate a substantial foundation for steady improvement in business conditions, and it is felt that Utah and the intermountain section are in good shape.

Seattle

Production of lumber by Northwest mills has not decreased, although orders have diminished, and demands from wholesalers are lower than they have been for a long period. The mills are speeding up production and are making an effort to replenish yard stocks which are exceedingly low.

Building activities remain normal, with the month of June showing permits for $5,125,000, of which $3,000,000 was for the new Hotel Olympic. Aside from the big hotel permit, the showing was good, with residence building looking up, and a number of good-sized projects started. Reports from other cities and towns in the state, particularly in the Puget Sound district, indicate that there will be a continuation of building during the month of July.

Figures for the first six months of 1923 show a gain of 34 per cent over the first six months of 1922, the valuation of buildings in the 1923 period being $3,000,000 higher than for the first half of 1922.

General seasonal slowing up of demand in practically all lines is apparent in Seattle retail trade, and the next two months are expected to be light.

Electrical contractors and dealers report a continued shortage in conduit with sustained demand, and shipments from eastern points coming through slowly and irregularly. Other stocks are in good shape, with demands keeping up. Indications point to a continuance well into fall months.

Los Angeles

To the first of July it is estimated that the year's building in Los Angeles is approximately $91,000,000 as compared with $121,206,787 for the entire year of 1922, and $82,761,386 in 1921. Postal receipts the first six months of this year were $3,281,763 while for the entire year of 1922 they were $5,813,139 and in 1920 only $4,190,660.

The shortage of cement that caused a slight scare in building circles during the month has passed and from the report for the month the building activities were not affected in the slightest degree.

The Monroe Centennial and Motion Picture Exposition that is in progress now has attracted numerous visitors from all over the country and the hotels in the city and the beach resorts are crowded.

Business in the electrical industry holds up in remarkable fashion, this is particularly true of radio, which in the past has shown a considerable slump at this period of the year. Wholesalers and retailers report very good business. The sale of electric fans has not been very encouraging up to the present time but this is due to the cool weather that has prevailed thus far this season. On the few occasions that the weather has warmed up dealers were not able to get fans fast enough to supply the demand.

Denver

Weather conditions and conservatism have to some extent affected the forward trend of business indicated in this district during the earlier months of the year. Heavy rains have retarded farm operations although damage from floods has been practically negligible as compared to adjacent territory to the east and south. The moisture however has been of incalcuable benefit to agriculture and livestock, two of the chief industries of the district, and also encouraging to general business and banking.

Wholesale distribution of merchandise has been made in large volumes. Mining operations have shown no cessation while crude oil production is the highest on record.

June building permits were issued by the city in the amount of $2,071,700 an increase of $256,000 over the same month last year. The permits for the first half of the year amounted to $2,302,450 over the corresponding period in 1922, with a total of $11,534,450. Only the most serious kind of a building slump will prevent the present year from establishing a new high record for building.

In electrical lines the outlook is optimistic though cautious. Jobbers report a slight falling off in orders but this movement has every indication of a temporary nature. Conditions with the contractor-dealer are improving gradually with better prices being obtained for work. Heating appliances are slow while fan business is picking up with warmer weather.

Portland

Production of lumber by the mills of the Northwest has not decreased despite the fact that orders have diminished and demands from wholesalers are lower than they have been for a long time. The 130 mills reporting for the week of June 30 were producing at a rate 25 per cent above normal. There is no indication of a curtailment in the production as the unfilled orders are large and practically no stocks are on hand. The condition is not considered alarming, in fact the price reductions that have occurred have been welcomed by many mill men who feared a runaway market.

Portland building permits for the first half of 1923 were practically the same as for 1922 but showed a falling off of residence building and a corresponding increase in the other classes of construction.

The port of Portland during the first half of 1923 handled a much larger volume of freight, both inbound and outbound than during the corresponding period of 1922. Foreign shipments fell off somewhat but this was more than offset by the increases in domestic freight. The greatest increases occurred in traffic between Portland and the Atlantic seacoast. Another new steamship line has been added for trade with Europe, with a large steamer assured at least once a month.

An interesting statement showing Portland's financial status in the twenty-two banks on June 30 has been issued. The deposits, resources, loans and discounts, and cash and exchange, all showed a stronger condition on this date than a year ago, and with the exception of cash and exchange, the condition of all departments was substantially better than on April 3, 1923, the date of the previous statement.

Central stations are devoting a large amount of effort to the sales of ranges with gratifying results.

Construction News

Bridges

Calif., Redding—Contracts have been let by the Board of Supervisors for the building of three reinforced concrete bridges, one across Big Hatchet Creek, between Montgomery Creek and Burney, will cost $11,750. Another across Little Hatchet Creek, on the same road, will cost $6,793. A bridge across Roaring Creek, between Montgomery Creek and Bend, is to be built for $2,734.

Colo., Denver—The State Highway Department only called for bids on one bridge of any importance during June and that was for a concrete span over Clear Creek, on the Denver-Arvada main highway. Construction will be done by the Colorado Bridge Co., at a cost of $35,000.

Wash., Okanogan—All bids for erection of proposed five-span concrete bridge at Omak were rejected by Okanogan County Commissioners, and new bids will be called. Low bid was that of the Union Bridge Company, Seattle, $84,736. Work involves 2,040 cu. yd. of concrete, 142,000 lb. of reinforcing steel and 13,000 ft. of piling. Bridge will be 408 ft. long, with a 20-ft. roadway.

Wash., Toledo—Union Bridge Company, Seattle, on a bid of $62,000, received contract for a steel and concrete bridge across the Cowlitz River, at Toledo, from the Van Ness Lumber Company. Bridge will be 600 ft. long, consisting of two 150-ft. steel spans on concrete piers, with 300-ft. trestle approach.

Buildings (Industrial)

Calif., Riverside—Southern Sierras Power Company will start work in about 30 days on the proposed office structure for the company on 8th Street east of the Riverside Press Bldg. Plans will be rushed and forwarded to the Denver office for approval. The building will be 2 stories in height, of reinforced concrete construction.

Calif., Ontario—Chamber of Commerce has signed contract with Ontario Motor Products Company assuring the establishment of a new factory here. The company manufactures automobile specialties and is at present located in El Paso, Texas, and has about $50,000 equipment and machinery which will be moved to Ontario. The new site is on the Southern Pacific tracks, near the Southern Counties Gas Company. Construction of the building will start within a week.

Calif., San Diego—San Diego Smelting and Refining Company has started work on the construction of a $75,000 smelter on the line of the S.D.&A.Ry., between 28th and 29th Streets. Albert A. Sampson, 140 Cuyamaca Avenue, San Diego, is general manager of the company. The first unit will consist of 4 rotary oil burning furnaces with a capacity of 4 tons of ore an hour, for furnace, and a 1-ton converter.

Calif., Los Angeles—Frank D. Chase, Inc., engineers, 533 Title Insurance Bldg., has completed plans for a 1-story factory building to be erected at 49th and Loma Vista Streets in the Central Manufacturing District, for the Globe Soap Company. Brick, 96 x 125 ft., compound roofiing, wood roof trusses, steel sash, loading platform, mezzanine floor, boiler room, concrete and wood floors, soap and glycerine tanks, metal skylights; the building will be erected by day labor, under the supervision of the engineer.

Calif., Los Angeles—Architect A. C. Martin, 431 Higgins Bldg., is completing plans and will take bids soon for the erection of a 5-story, class A warehouse to be erected at San Pedro and Commercial Streets, for the Los Angeles Warehouse Company. It will be 100 x 160 ft., reinforced concrete construction basement, compound roofing, steel sash, elevators, steel rolling doors, concrete floors, metal skylights, wire glass, sprinkler system.

Colo., Denver—Plans for increasing the height of the Railway Exchange building at Seventeenth and Champa streets to 12 stories over the entire six lots in the property, are now in process of preparation by the architectural firm of Fisher & Fisher with offices in the United States National Bank Building. The floor plan will follow that of the present 7-story building covering half of the property. When completed it will be the second largest office building in the city in regard to number of offices. John A. Ferguson, prominent local capitalist, is owner of the property.

Ore., Eugene—The erection of a $1,000,000 lumber plant and the inauguration of logging and sawmill operations on a large scale will follow immediately as a result of a recent purchase by George H. Kelly and associates of approximately 865 million feet of timber, located on the north fork of the Willamette river about 35 miles from Eugene. Mr. Kelly announced that the corporation capitalized at $2,500,000 would be formed immediately and that plans would be laid at once for the erection of the sawmill with a capacity of 50 million feet of lumber a year, the building of 13 miles of logging railroad and the establishment of a lumbering town about two miles west of Oakridge. The tract consists of about 15,700 acres and is two miles west of Oakridge on the Natron cutoff.

Ore., Portland—The general contract for the construction of the garage on 21st near Washington street has been awarded to H. E. Doering. The building is 60 x 200, three stories, of flat slab, concrete construction, and will cost $65,000.

Wash., Aberdeen—The Grays Manufacturing Comapny is to rebuild immediately the planing mill that was destroyed by fire at a loss of $50,000.

Buildings (Miscellaneous)

Calif., Marysville—Auditorium—I. C. Evans, Marysville contractor, was the lowest bidder on the contract to build the proposed auditorium to be erected at Ninth and E Streets as a soldiers' memorial. His offer was $118,940. The awarding of the contract has been postponed, pending the settlement of several details under consideration.

Calif., Durham—School—Voters of Durham have placed their stamp of approval on the proposition to issue $90,000 in bonds for the erection of the Durham Union High School building here. The vote was 386 for the bonds and 92 against them. The proposed new building will have a floor space of 15,000 sq. ft. and will provide accommodations for 150 students. This is the second time the proposition of issuing bonds for a new school building has been voted on, a previous proposition to issue bonds having been defeated by a narrow margin.

Calif., Livermore—Hospital—Bids for construction of a 250-bed Veteran's Bureau hospital to be erected here will be advertised for within the next few days, according to an announcement recently made by the bureau at Washington, D. C. Another 250-bed hospital will be built at some location in Southern California.

Calif., Sacramento—Club—E. C. Hemmings and Leonard F. Starks have been named associate architects for the new million-dollar home of the Sacramento Elks Club to be erected at 11th and J Streets. Jens C. Peterson will be consulting architect.

Calif., Hanford—Civic Center—Hanford voted over 5 to 1 in favor of a $190,000 bond issue for a civic center and public auditorium.

Calif., Los Angeles—School—Architects Noerenberg & Johnson, 401 Los Angeles Railway Building, are completing plans for a class A school building to be erected on the 16th Street school site for a part-time school. It will be 3-story, designed for 6-story, 265 x 100 ft., with a 1-story auditorium and gymnasium, 100 x 57 ft; reinforced concrete construction, face brick and terra cotta exterior, compound roofing, steel roof trusses over auditorium, maple finish floors, swimming pool; $400,000. The board of education will advertise for bids shortly.

Highways

Calif., Escondido—Supervisors of San Diego County granted the request of a delegation of citizens to the paving of 1.6 miles of inland highway going through Escondido. The county agreed to pay $26,000 of the cost, leaving $9,000 to be paid by the city. Bids are to be advertised for as a result of the decision. Bids will also be called for paving a portion of the same highway from Lake Hodges to the Escondido city limits, and also from Vista to Bonsall, and from Fallbrook to the Riverside county line.

Calif., San Francisco—Appropriating $500,000 for the new highway down the peninsula, the finance and street committees of the Board of Supervisors has taken the first step to relieve the congestion that has caused complaints. The supervisors approved of the highway program as recommended by Assistant City Engineer Clyde Healy, with the exception of an item of $250,000 for the completion of the Market Street extension project. A total of $688,000 was appropriated, the money to come out of the good roads fund.

Other projects and the amounts involved approved were: Marina Boulevard, $80,000; Virginia Avenue, $30,000; Avalon extension, $20,000; San Jose Avenue widening, $18,000; Silver Avenue improvements, from Mission Street to San Bruno Avenue, $25,000.

Calif., Yuba City—The contract for paving the Bunce lateral for a distance of a mile—part of the county highway system—was awarded by the supervisors to Galbraith and Janes, of this county, for $12,390. Heafy, Moore and McNair secured the contract for patching and paving several short stretches of road, to cost $60,595.

Calif., Los Angeles—City Engineer Griffin is preparing plans for the six viaducts to be built over the Los Angeles River by the city, county and railways, following the voting of the $2,000,000 bonds for the city's share of this work. The viaducts will be built at Macy, Aliso, First, Fourth, Seventh and Ninth Sts. The Ninth St. structure, as well as the others, will be reinforced concrete, 70 ft. in width; 3 arches, with long approaches. Work will necessitate the construction of six piers. The Ninth St. bridge will carry no railway tracks and will have a 56-ft. roadway, with 6-ft. walks and balustrade. The total cost will be $1,000,000, of which the city will pay $200,000.

Calif., Santa Barbara—An election will be held July 24, in the Santa Ynez Permanent Road Division, to vote on an issue of bonds in sum of $305,392, for paving approximately 25 miles roadway. Surveyors are at work on the maps. Owen H. O'Neil, County Surveyor. The specifications call for a road 18 ft. wide, of 6-in. oil macadam construction, with concrete culverts where necessary. It will be widened at all turns beyond the 18-ft. width.

Calif., San Bernardino—Secretary of Agriculture Wallace has just approved an expenditure

of $75,000 for extending the Big Bear Valley road in San Bernardino County three miles east of the dam, thus making the total length of the project a little over 13 miles, in the Angeles National Forest. Expenditures amounting to $160,000 have been authorized by the secretary for the construction of 15 miles of road in Mariposa County, between Murphy and the Big Trees in the Stanislaus National Forest. An expenditure of $150,000 for the construction of a little more than eight miles of road in Kern County, between First Crossing of Kern River and Democrat Springs, has also been authorized by the secretary. This road lies within the Sequoia National Forest and will open up a large recreational area. The Kern River Canyon offers a large number of excellent camp sites.

Colo., Denver—Contracts for state highway work totaling $520,000 have been awarded to four different companies as the result of the governor approving the projects, which it is understood will be completed by early fall. To the Colorado Bridge & Construction Co. of Denver, two miles of paving, on the Fort Morgan-Brush road, and five miles of concrete, on the Denver-Morrison road, the largest awards have been made. The Dale & Hinman Co. of Denver, three miles of gravel surfacing, southeast of Durango, and a slightly larger project near Clifton; the H. M. Fox Co. of Florence, for gravel surfacing on the Pueblo-Florence road; White & Johnson, contractors, of Sterling, for three miles of concrete paving, each side of Platteville, are the other awards.

Idaho, Boise—Two miles of pavement are to be constructed between Fruitland and Payette, at an estimated cost of $81,000, more than 50 per cent of which will be paid by the federal government. According to plans now formed, the new pavement will be completed before the heavy hauling of fruit begins in the fall.

Idaho, Boise—Shoshone County has voted $350,000 worth of bonds, the proceeds of which are to be used in constructing highways and bridges in the county. The particular piece of work for which the money will be spent is the construction of about 22 miles of paving from Wallace to Mullan on the east, and from Wallace to Kellogg on the west.

Nev., Carson City—Alston & Hoggan, Salt Lake City, submitted low bid to State Highway Department, at $39,954, for roadwork in Churchill County, between east city limits of Fallon and 4.99 miles south, Route 2, Section C-3, 4.99 miles.

Nev., Carson City—Alston & Hoggan, Salt Lake City, were awarded contract by State Highway Department, at $31,926.90, for roadwork in Washoe County, between Reno and Lawtons, Route 1, Section A-1, 3.7 miles.

Ore., Portland—At a recent meeting of the State Highway Commission, road and bridge contracts aggregating $310,422 were awarded as follows: Grading two miles and surfacing with crushed gravel, 6.3 miles of Hunter's Creek-Hunter's head section of Roosevelt highway in Curry County, to Schell & McKay of Bridge, Ore., for $77,880. Grading and rock surfacing 15.4 miles of the Vale-Ontario section on John Day river highway in Malheur County, to A. D. Kern, Portland, for $121,213. For constructing embankment approaches for the new Lewis and Clark river bridge on the Roosevelt highway about two miles south of Astoria, to Pacific Bridge Company of Portland, $26,147. Building five bridges over Cummings Creek on the John Day river highway near Mt. Vernon in Grant County, to Monson-Trierweiler Co., Portland, for $53,315. Constructing bridge over Applegate River near Grants Pass on the Grants Pass-Crescent City highway, to Union Bridge Company, Portland, for $31,768.

Ore., Springfield—Bids for the surfacing of the Mohawk Valley road show the C. M. Igoe Company the lowest bidder for the 14 miles of construction, for $34,500. This company is expected to take the contract.

Ore., Roseburg—The eight-mile section of road in the Rock Creek forest boundary of the North Umqua road is to be completed, at an estimated cost of $35,000, as announced by Forest Supervisor Neil.

Ore., Salem—The State Highway Commission has awarded to Bauers and Bauers the contract for grading and surfacing the John Day highway in Grant Count. The improvement covers a distance of 14 miles and the cost will total $157,000.

Ore., Eugene—The Bureau of Public Roads has let the contract to the Warren Construction Company for the building of the Roosevelt highway between Devil's Lake and Siletz Bay in Lincoln County, the contract price being more than $200,000, according to word received at the office of the Siuslaw National Forest here.

Utah, Salt Lake City—The State Road Commission has forwarded to the federal bureau of public roads district office at Ogden, the project statement covering the proposed resurfacing of the four miles of pavement between Layton and Clearfield, in Davis County. The estimated cost of the work is more than $100,000. The project statement estimates are based on a 2-in. topping of bituminous concrete, with 3-ft. extensions on both sides of the present 16-ft. pavement, making a total width of the surfaced portion of the roadway 22 ft. The bituminous covering under the present estimates would be 20 ft. wide. The commission awarded to Kroft & Bundy the Woodruff-Wyoming seven miles of gravel surfacing, and to the Reynolds-Ely Construction Company the 12 miles of gravel road and two miles of cement concrete paving between Moroni and the Juab county line at the head of Salt Creek Canyon. These contractors were the respective low bidders on these projects.

Wash., Chehalis—The contract for the construction of road work has been awarded to George A. Bandoret of Bryn Mawr, Wash., on his bid of $39,299. The work is to be grading, draining and clearing the right of way on the National Park highway for a distance of a little over two miles from Salkum, where last year's improvement stopped.

Wash., Raymond—Graveling 15.95 miles between Palix and Nasel in Pacific County, on the Ocean Beach highway, was awarded to K. L. Goulter & Co., Ilwaco, for $56,577. Graveling 10.86 miles between Nasel and Sand Bridge road in Pacific County was awarded to the same firm, for $28,962. Clearing, grading and surfacing with crushed rock 5.38 miles to Johnson's Landing, to Pentello & Pelemo of Nasel, for $54,060.

Wash., Olympia—The State Highway Commission recently awarded the following contracts for state work in Wash.: Ocean Beach highway, Pacific County, .38 mile, clearing, grading, draining and surfacing with gravel, to J. E. Jones, Olympia, for $19,457; Olympic Highway, Mason County, Mill Creek to Shelton, .62 mile, clearing, grading, draining and paving, to Philbrick & Nicholson, Shelton, for $47,666.76; Inland Empire highway, in Wall County, from Waitsburg easterly, grading, draining and paving with concrete, to Pacific Coast Paving Company, Portland, for $52,155; Inland Empire highway, Whitman County, Pullman to Palouse, 11.32 miles, clearing, grading and draining, to J. H. Ferterling, Moscow, Idaho, for $108,378.

Wash., Bellingham—Whatcom County Commissioners recently awarded to C. L. La Plant of Sedro Woolley contract for paving 2¾ miles of the Acme-Wickersham highway, on his bid of $69,635. Work involves 27,000 sq. yd. of concrete, 6 to 7¼ in. thick.

Wash., Seattle—King County Commissioners recently awarded to Thomas Hanson, Seattle, contract for grading the A Solberg road, on a bid of $54,868. Work involves 90,673 cu. yd. of excavation.

Wash., Olympia—Funds amounting to $962,177, to be spent on federal aid roads in the State of Washington, will become available at the beginning of the fiscal year of 1924. With the state's appropriation of an equal sum, which is required, there will be $1,924,355 spent in Washington in 1924 on highway work.

Irrigation

Ariz., Yuma—Pacific Building Company, O. W. Cotton, president, 334 C St., San Diego, reports that the new Mohawk Valley Irrigation District has been organized to provide for 30,000 acres of land along the Gila River, starting 50 miles east of Yuma, and extending to within 140 miles of Phoenix. The project is in charge of Jim Dobbins, engineer, and O. W. Cotton, the latter having charge of the sale of land in the district. Norton P.O., on the Bankhead Ocean-to-Ocean highway, is in the center of the district. About 60 wells will be drilled to utilize the underground waters, and diversion canals will be constructed on the Gila River.

Idaho, American Falls—Bonds to the amount of $2,750,000 were authorized at a recent election in the American Falls Irrigation District, for the purchase of storage water rights in the American Falls reservoir. The erection of the dam is thus made certain. This will create a storage reservoir of Snake river waters of 1,500,000 acre-feet capacity. The bonds represent the district's share of the construction work on the reservoir.

Mont., Fort Benton—Action is contemplated towards the formation of an irrigation district in the Lonesome Prairie section, involving some 250,000 acres of land. Engineers of the Anaconda Copper Company are said to have made a preliminary investigation and have reported favorably. The project involves the use of water from the Marias River and the building of a reservoir for impounding the waters.

Wash., Riverside—The Riverside Irrigation District Engineer is now preparing specifications for bids on the contract for an irrigation system to cover the Riverside district, the work to consist of a diversion dam, hydroelectric power plant, transmission lines, community pumps and distributing ditches. Engineering reports show 4,020 irrigable acres, for which the district voted $450,000 bonds. One-half of the power developed will be used for pumping and the remainder for lights, heat and general purposes.

Wash., Yakima—Work on the Satus Irrigation Project, for which the government has set aside $125,000, to be expended during the coming fiscal year, will be under way early in July, according to plans of the United States Reclamation Service. This unit of the Satus project will be watered from a canal cut out of Toppenish Creek, and distributed over 10,000 acres of land by gravity. When completed, the Satus project will irrigate 32,000 acres. The unit takes in the lowest lands that may be watered by a gravity flow; water will be pumped to the second unit, while the third will necessitate the construction of a dam to impound the flood waters of Satus Creek, which will cost $1,000,000 or more. The construction will be mainly open canal, and the work will be done by dragline excavators.

Ore., Salem—Permit has been issued by State Engineer Cupper to A. D. Gardner of Stayton, for the appropriation of 1,000 sec.-ft. of the water from the North Santiam River, for power development. Mr. Gardner proposes to develop a total of 13,636 hp. at four points between Mehama and the present development at Stayton, at an estimated cost of $250,000. It is proposed to utilize the power for general commercial purposes and supply additional power to industries at Stayton, which now are utilizing 1,500 hp. developed at Stayton.

Wash., Vancouver—The Northwestern Electric Company plans during July to undertake the

last unit of its $121,000 building program for 1923. This unit will be the erection of the second half of the big substation at 8th and King Streets, and will cost $80,000. When completed, the substation and the high voltage lines extending from White Salmon through Camas and from Portland practically obviate all chance of a complete breakdown in Vancouver's lighting system.

Wash., Seattle—The Puget Sound Power & Light Company has awarded contract to Harry Brandt, Seattle, for construction of a $15,000 substation at 4314 Pasadena Place.

Wash., Chehalis—The North Coast Power Company will run a power and light wire to the Lewis and Clark State Park, 12 miles south of Chehalis, to equip the park for camping grounds for tourists.

Wash., Seattle—The construction of the North Skagit substation building in the north district of the city will proceed by day labor under direction of Engineer C. F. Uhden, and will be completed within three months. The station will house the necessary electrical machinery for receiving of high tension current from the Gorge Creek powerhouse on the Skagit River. The current will come in at 165,000 volts and will be distributed at 26,000 volts. Engineer Uhden states that work on the building of the Gorge Creek powerhouse is now practically complete, and that the installation of the 150-ton crane will be started shortly.

Wash., Tacoma—Contract for erection of a tideflats substation building, to house the transformers of the Seattle-Tacoma intertie power transmission line, has been let to Steiro & Hansen. Building will be 20x65 ft., of concrete.

Power Projects

Colo., Collbran—Application for a franchise to construct and operate a power and light company has been made to the city board of trustees by C. L. Fenn of Salt Lake City. Owing to alleged insufficiency of advertising, action on the original petition has been delayed, but the sentiment expressed in the Plateau Valley, which will also be served by the company, if the permit is obtained, is strongly in favor of the new plant.

Railways

Ariz., Tucson—The proposed route of the Tucson, Phoenix & Tidewater Ry. will parallel the Southern Pacific line out of Tucson, to a point six miles beyond Red Rock, crossing the latter line by overhead trestle, crossing the Gila River and following the river seven or eight miles, down stream, crossing Sacaton Indian Reservation, thence to Chandler, skirting that city, and entering Phoenix by way of Mesa and Tempe. Jas. S. Douglas, promoter. The City Commission has voted to submit to the voters, on July 18, matter of franchise for road through Madison Street, Tucson.

Calif., San Luis Obispo—Southern Pacific Ry. plans to expend $50,000 for a new power plant at local railway yards. It will consist of a battery of four modern water tube boilers, of 100 hp. each. W. H. Kirkbride, engineer of maintenance, in charge. Included in the program of improvement are a 100-ft. turntable, and a reinforced concrete oil storage building, costing $4,000. The company is also opening a large granite quarry at Santa Margarita, to provide track ballast.

Calif., Los Angeles—F. R. Houghton, freight traffic manager of the Santa Fe system, announces that the railway is planning an extension of its line into Long Beach. The company is said to be negotiating for a site of 224 acres on the water front, now owned by the Dock and Terminal Company.

Calif., Los Angeles—Sharp & Fellow, Central Bldg. have the contract to construct a 3-mile spur track into the Torrance oil fields for the A., T. & S. F. Ry., costing $175,000. W. K. Etter, acting general manager.

Calif., Los Angeles—Freight congestion in the section west of Beaumont will be greatly relieved through the double-tracking of the Southern Pacific from Colton to Beaumont, a distance of 23 miles. Heavy increases in traffic make imperative the added facilities for efficient freight handling. The construction program includes new sidetracks at all stations between the two terminals. Work will progress at once.

The Santa Fe Railroad Co. has announced the purchase of 160 acres four miles south of Inglewood, for purposes of industrial development. Approximately $200,000 was paid for the property. The land lies along the new Harbor line of the company and fronts on Redondo Boulevard. Eastern industries will be brought to the industrial site under lease. Ample trackage facilities will be furnished, it is stated.

Calif., San Diego—The City Council of San Diego, on June 28, granted to the San Diego Electric Railway Company a new 50-yr. blanket franchise, covering all franchises on the lines of that company and extending each to 50 years. The franchise includes the right to the street car company to build a new line to La Jolla, through Mission Beach. Granting of right to the street railway company to abandon certain lines on Point Loma and the substitution of busses was deferred until decision of the State Railway Commission is made.

Colo., Denver—The Denver Tramway Co., though in the hands of a receiver and suffering from the continued campaign by the city to force a return to a five-cent fare, as the result of improvements to its generating system is now in position to provide extensions to some of the principal lines in the city. Among them will be a six-block loop on the 13th Avenue line, and later a similar extension at the end of the line to accommodate the new $1,000,000 medical school and hospital of the State University.

Wash., Yakima—The O.-W. R. & N. Co. will spend $190,000 here during 1923 and 1924, according to J. P. O'Brien of Portland, general manager of the road. Freight offices and a depot costing $70,000 to $75,000 will be built this summer. About $40,000 will be spent on 13 acres acquired for industrial sites and a $75,000 passenger station has been put in the 1924 budget, and undoubtedly will be approved, Mr. O'Brien said.

Street Lighting

Calif., San Bernardino—C. E. Johnson, City Engineer, has plans under way for street lighting projects totaling approximately $104,000. These have been approved by the property owners. Bids for the lights on Mt. Vernon Avenue, between 3rd and Mill Streets, costing $15,000, will be asked soon.

Calif., Manhattan Beach—W. T. Grauer, Manhattan Beach, was awarded contract by city trustees, at $1,910, for constructing ornamental lighting systems on Marine Avenue, between Ocean Drive and Grand View Avenue.

Calif., Los Angeles—C. W. Sparks, 417 E. Seaside Blvd., Long Beach, submitted low bid to board of public works and was awarded contract, at $10,467, for furnishing and installing ornamental light systems in Belle Porte Avenue, between Weston Street and 50 ft. south of 255th St.

Wyo., Rawlins—The city council is receiving bids and allowing demonstrations to be made for a new ornamental lighting system to be installed in the business section.

Streets and Sewers

Calif., Williams—Voters here defeated the proposition to issue $105,000 in bonds for a municipal water and sewer system. The vote was considered heavy and the issue was defeated by a narrow margin. On the $45,000 sewer bond issue the vote was 261 yes and 136 no. On the $60,000 water bond issue the vote was 252 yes and 145 no. This is the second time the proposition to issue bonds for this purpose has been defeated.

Calif., Redding—Contracts have been signed by W. A. F. Norris of the Warren Construction Company and E. A. Rolison, City Manager, for paving 252,000 sq. ft. of streets and for making other street improvements, including sidewalks, gutters and curbs. The total cost is estimated at $103,000.

Calif., San Francisco—Street contracts aggregating $12,934.69 were let by the Board of Public Works, the awards being as follows: Collins Street, between St. Rose Avenue and Geary Street, $588.25, to the City Construction Company; 22nd Street, between De Haro and Rhode Island Streets, $3,296, to City Construction Company; Heyman Avenue, from Coleridge Street to Prospect Avenue, $3,240.06, to Municipal Construction Company; Balboa Street, between 22nd and 23rd Avenues, $596.58, to Municipal Construction Company, and Gilman Avenue from Ingalls to Griffiths Streets, $5,213.70, to M. J. Lynch.

Calif., Oroville—Contract for laying approximately 4,000 ft. of sewer, which will complete the sewering of Orange Heights, Oroville's new residence subdivision, has been let by E. W. Clemo, owner of the subdivision, to Chambers and De Golyer, Oakland contractors. The work will start about the middle of the month and will be completed so that home builders may connect with the sewer before winter.

Calif., Los Angeles—T. E. Shafer, 407 N. Rampart Blvd., was awarded contract by Board of Public Works, at $10,781.03, for improving Mountain View Avenue, between Court St. and First St., involving grading, concrete paving, oiling and rolling, walk, gutter, storm drain complete. Engineer's estimate, $10,035.42.

Calif., Visalia—Bids will be advertised for at once for the construction of a sewage disposal plant on the city sewer farm, for which bonds were recently voted. The tank will be a remodified Imhoff, with special sludge-digesting tanks to take care of the refuse from the canneries.

Waterworks

Calif., Santa Barbara—City Council has called a special election for July 24, to vote a special tax assessment to raise a fund of $100,000 for improving the water mains on State Street and connecting them with the source of supply.

Colo., Deertrail—As the result of a special election held recently, approval has been given to the issuance of $40,000 of bonds to cover the building and construction of a complete water works system under the direction of A. A. Weiland, a Pueblo engineer.

Ore., Salem—Plans for the Oak Lodge Water District have been prepared by H. L. Gilbert, engineer, Couch Building. The plan contemplates furnishing Bull Run water to a district bounded on the north by the south line of Milwaukie, including Jennings Lodge on the south, and lying between Oatfield road and the Willamette River. The cost is estimated at some $200,000. A bond election will be held, Aug. 2, and it is expected that the measure will pass. Contractors who expect to bid are urged to examine the plans at the office of the engineer and be prepared to submit figures as soon as the bonds are voted.

Wash., Camas—Stevens & Koon, consulting engineers, have plans and specifications for improvements to the water system of Camas, and bids will be received by W. E. Farr, City Clerk, at Camas, 8 p. m., July 20. The improvements will include the building of intake structures, hauling and laying 8½ miles of 8 and 10-in. welded steel pipe, furnishing and placing pipe line appurtenances, furnishing and erecting steel tank of 50,000 gal. capacity, and making certain improvements to the distribution system. Plans can be secured at the offices of the engineers, at their Portland office.